(11.)

PRIZE REPORT

ON THE

FARMING OF LANCASHIRE;

BY

WILLIAM JAMES GARNETT, ESQ.,

OF BLEASDALE TOWER.

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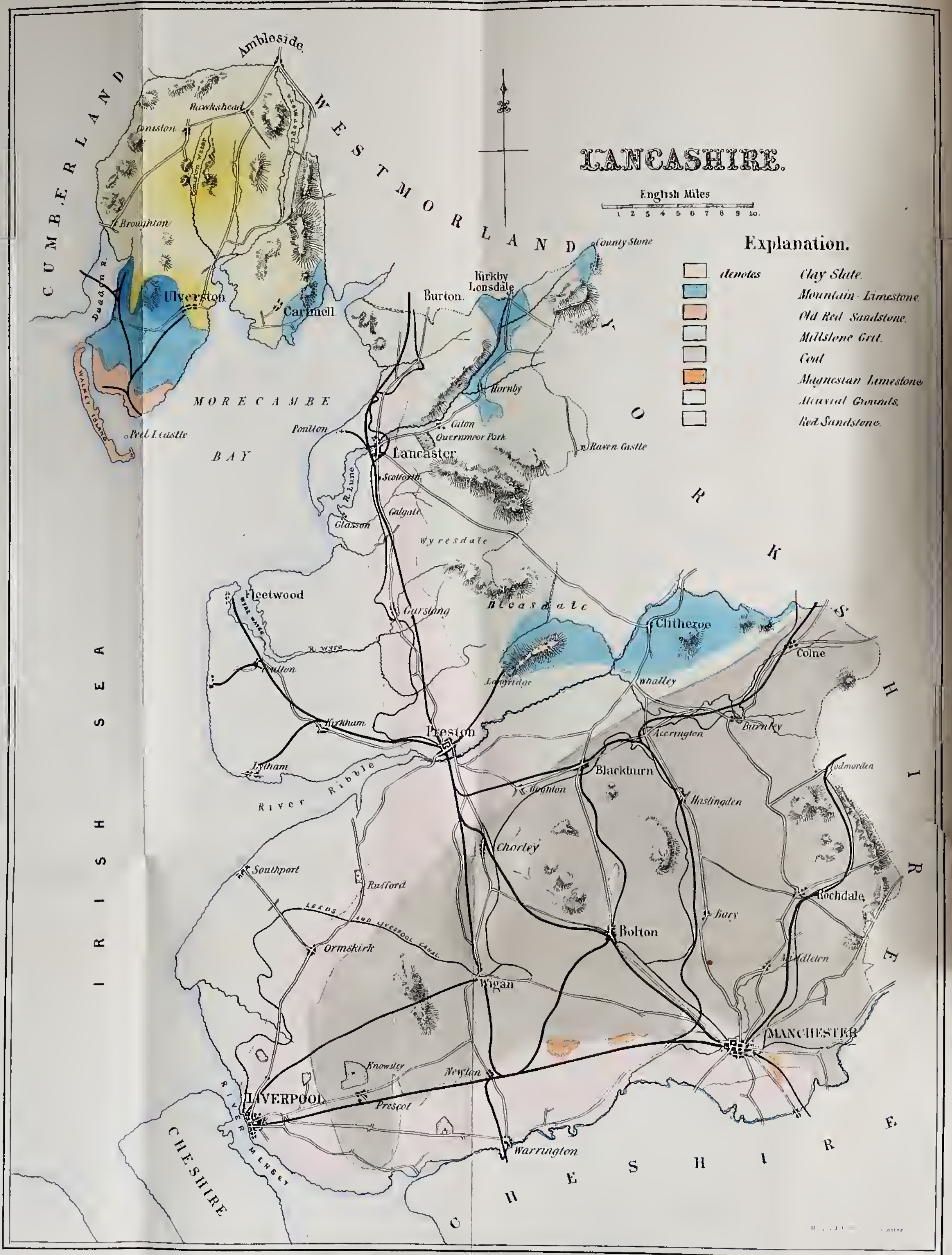


LANCASHIRE.

English Miles
1 2 3 4 5 6 7 8 9 10.
Explanation.
denotes
Clay Slate.
Mountain Limestone.
Old Red Sandstone.
Millstone Grit.
Coal.
Magnesian Limestone.
Alluvial Grounds.
Red Sandstone.
CUMBERLAND
WESTMORLAND
YORKSHIRE
CHESHIRE
IRISH SEA
MORECAMBE BAY
Ambleside
Hawkshead
Coniston
Coniston Water
Windermere
Broughton
Duddon R.
Ulverston
Cartmell
Walney Island
Peel Castle
County Stone
Kirkby Lonsdale
Burton.
Hornby
Caton
Quernmoor Park
Raven Castle
Poulton
Lancaster
R. Lune
Scotforth
Glasson
Galgate
Wyresdale
Fleetwood
Wyre Water
Garstang
Bleasdale
R. Wyre
Poulton
Longridge
Clitheroe
Whalley
Colne
Kirkham
Preston
Lytham
River Ribble
Accrington
Burnley
Blackburn
Hoghton
Haslingden
Todmorden
Chorley
Southport
Rufford
Leeds and Liverpool Canal
Ormskirk
Bolton
Bury
Rochdale
Middleton
Wigan
MANCHESTER
Knowsley
Newton
LIVERPOOL
Prescot
Warrington
River Mersey

FARMING OF LANCASHIRE:

BY WILLIAM JAMES GARNETT.

PRIZE REPORT.

THE county of Lancaster is a very important and a very influential one; but most assuredly its importance and influence do not arise from the excellence of its farming: whatever may be our character for skill in manufactures or success in commerce, we are sadly behind the rest of the world in agricultural attainments, and any traveller along the North Western Railway, from the time of his entering, by crossing the Mersey near Warrington, to the time of his quitting Lancashire for Westmorland, must, I fear, leave it with the impression that he has been passing through an ill-drained, badly cultivated, and neglected district. The northern part is decidedly better than the southern, but he would judge of it as a whole; and if, in the rapidity of his flight, his eyes should perchance have rested for a moment on a good field of turnips or a clean stubble, a straight fence or a neatly-cut edge, the oasis in the desert is so small, and the vision so fleeting, that it would have little effect in altering—or even, from the contrast with its neighbours, might rather tend to confirm—his opinion that the standard of farming in Lancashire is far below that of more southern counties he may have traversed in his journey.

Now, however simple and easy a matter it may be to observe the fact, it is by no means easy at first sight to assign the reasons, for this state of things. If he consider the great wealth and intelligence which undoubtedly are found amongst a large portion of the inhabitants of Lancashire, he might reasonably expect something better in the way of farming; and before I proceed to enter into the subject-matter of this report, I would venture briefly to advert to a few of the causes which may excuse, in some measure, the defects and short-comings of my native county.

And first, let us look at the map of Lancashire. I propose to divide it into three parts; *the Southern, Middle,* and *Northern Divisions,* of which the three principal rivers of the county, the Mersey, the Ribble, and the Lune, shall be the boundaries. The Mersey forms the natural boundary to the south, between Lancashire and Cheshire: the land lying between this river and the Ribble, which runs by Preston, I would call *the Southern*

Division, or No. 1. The tract of country from the Ribble to the Lune, I would call *the Middle Division,* or No. 2, which includes the whole of that peculiar and interesting district known as *the Fylde ;* and from the river Lune, which flows by Lancaster, to the northern boundary, which separates Lancashire from Westmorland and Cumberland, I would call *the Northern Division,* or No. 3. Each of these great divisions is essentially different from the others in important points, such as the character of the soil, the climate, and the people, and I therefore would make this new division, rather than adopt either the ancient boundaries of the Hundreds or the Parliamentary Divisions, inasmuch as neither of the latter are marked by any great natural features, nor are they suggestive of any striking diversity in the soil or the inhabitants, and would not convey to the general reader any distinct idea of the districts as they are successively brought under his consideration ; whereas, if we take the three great rivers and divide the county by these nearly parallel lines, a moment's glance at the map will show to any one the part then treated of.

The difference between the Southern Division, and the two others to the north of it, in its geology, in the nature of its soil, and the character and habits of the people, is most striking, and exercises a very important influence on the farming of the whole county. Its wealth, position, and extent deserve the first place in considering the causes of the past and present state of farming in Lancashire.

In the Southern Division lie the great *coal-fields ;* these have led to the extraordinary development of the cotton manufacture and all its consequences, and have created a market for labour and skill far beyond anything the farmer could offer, and the consequence has been that all who were anxious to "get on" in the world, to make their fortunes rapidly, to gain large profits and quick returns on small investments, or who, tempted by high wages and the prospect of regular work, were not content to plod away their lives at the plough's tail, have been drawn into the great vortex of trade, and now people the large towns of Liverpool, Manchester, Bolton, &c. ; and whether it be from the constant and active intercourse between man and man, or the greater exercise of skill and ingenuity, and the high premiums offered for clever artisans in the towns, or from whatever cause it be, I fear it must be admitted that the inhabitants of the towns greatly exceed in acuteness and intelligence their fellows in the country districts : thus the capital, skill, and enterprise of the county being attracted to the towns, the rural districts have been comparatively deserted and left to those happy men who, content to live and die as their fathers had done before them, did not aspire to anything beyond, even in their own business of farming.

The climate of Lancashire is another counteracting cause ; it varies according to the different districts : in the hilly regions to the north and east, it is of course cold and piercing, but in the lower parts, shelving to the south and west, it is generally mild and genial ; but throughout the whole of it the fall of rain is far greater than in the south of England. Mr. White, Secretary to the Liverpool and Manchester Agricultural Society, in his evidence last year before the Committee of the House of Commons on Tenant Right, speaking of South Lancashire and the neighbourhood of Warrington, says, "We have 36 inches of rain falling in the twelve months ;" but in the more hilly parts of the county to the north, my own observations, taken from one of Crosley's patent rain-gauges, would place it higher than that. The average quantity per annum in London, and the counties abutting on Middlesex, is about 20 or 21 inches, whereas in Lancashire I should say it was more than 40 inches, just *double ;* and though the air is for the most part naturally pure and salubrious, yet this great humidity is a serious obstacle with which the farmer has to contend ; and unless his land be thoroughly drained, is an effectual barrier to success either in growing or harvesting his crops.

The soil again is not naturally good, that is to say, in its undrained state ; it varies of course considerably, and large peat-mosses or bogs, such as Chat-moss in the southern, and Pilling, with others adjoining, in the Middle Division, are found throughout. Of these dreary wastes I shall speak more fully in their proper place ; but naturally they are perfectly sterile, and require a large outlay to make them produce anything, except, perhaps, fuel, of which great quantities are consumed by the neighbouring farmers and cottiers. With these exceptions, throughout the whole Southern Division, the soil partakes more or less of a clayey loam, very productive, if well drained, but without this necessary preliminary, cold and difficult to work ; and that it is not in its natural state favourable to vegetation is clearly evidenced by the miserable fences, together with the stunted and weather-beaten trees, which give a starved and bleak appearance, tend rather to show than hide "the nakedness of the land," and scarcely deserve the name of hedge-row timber. In the Middle and Northern Divisions the soil is more friable, and throughout *the Fylde* partakes more of the alluvial and peaty character ; still, without draining, it is comparatively unprofitable.

In *the mining districts* the ground is in many parts completely honeycombed and burrowed like a rabbit-warren : the superincumbent weight of earth over these excavations will often sink, and the levels of the surface becoming quite changed, any drains that may have been laid there are at once destroyed, and the owner's trouble and capital altogether lost ; this is very discouraging to a farmer, and an evil unknown in a purely agricultural district.

To these drawbacks, natural and artificial, may be added the consequence resulting from them, which is this :—That the men who have grown rich in those great marts of industry and commerce, Liverpool and Manchester, and other manufacturing towns of the county, when they seek a permanent investment for their property in land, frequently leave the county in which they have made all their money, and, unwilling in the autumn of their years to engage in new and untried undertakings, are led to seek in more southern counties a more genial climate, a more fertile soil, a higher class of farmers and farming, and a more tempting investment than Lancashire can offer. I do not deny that there are some commendable exceptions to this rule, but for the most part it is unhappily true, as our rushes and bogs abundantly testify.

I have thus attempted shortly to describe and account for the general aspect of the county, as it would appear to the eyes of a passing stranger, but though as a whole I believe the above description to be a true one, yet if we examine a little more closely, we shall find many cheering instances of progressive improvement, both in the case of large landed proprietors and the more humble occupiers of the lands of their fathers, which give good grounds to hope that there is a spirit at work which will soon change the face of the country and enable us to take our proper place amongst the farmers of England. The Earl of Derby, at Knowsley, Mr. Clifton, at Lytham, the late Mr. Ffarington, of Worden, whose untimely and premature end has left a blank at Leyland which can never in this generation be filled up, Mr. Wilson Ffrance, in the Fylde, and the Duke of Hamilton, at Ashton, and others, have each in their several districts set a good example of what may be done by perseverance and skill, combined with a liberal and judicious outlay of capital : they have now left us without excuse : let each man, then, in his own sphere, and according to his means and ability, be "up and doing" in the great and good work of improving the land, by employing the people, and we shall then soon cease to be famous as the worst farmed county between London and Edinburgh.

The *geographical* situation of Lancashire is between 53° 20′ and 54° 25′ north latitude, and between 2° 0′ and 3° 17′ west longitude ; it is bounded on the north by Cumberland and Westmoreland, on the east by Yorkshire, on the south by Cheshire and Derbyshire, and on the west by the Irish Sea. The extreme length is 74 miles, and its greatest breadth 44½ miles : its surface contains 1765 square miles, of which about 1125 are comprehended in the Southern Division, and 650 in the two other divisions. The area of the county comprises, according to the Ordnance Survey, 1,117,260 acres of land, of which about 350,000 are in tillage, 450,000 in pasture, and the remainder in woodlands, moors, and mosses.

The *population* in 1821 amounted to 1,052,200, and according to the last census in 1841 it had increased to 1,667,054, of which it may be fairly said that three-fourths are engaged in commerce and manufactures, or dependent upon them for their employment and support ; this allows 416,763 for the cultivation of the land.

The *great geological* features of the county consist in a chain of hills which separate Lancashire from Yorkshire on the east, and which run northwards from Ashton-under-Lyne, near Manchester, to Hornby. This tract of mountainous moor-land is chiefly composed of mill-stone grit and hard freestone formations, the soil for the most part being thin and poor and in the lower parts a strong clay. Amongst the highest hills of the range are Blackstone Edge, Pendle Hill, which is 1805 feet above the level of the sea, and the Fells of Bleasdale and Wyresdale. The district north of the river Lune from Lancaster has the metalliferous limestone for its immediate substratum; and as we approach the northern mountains of the county, which form the barrier between it and Westmoreland and Cumberland, the transition limestone and slate prevail. These hills, from their picturesque beauty and height, form some of the most magnificent features of the lake scenery in this part of England; Coniston Fell, the highest point of which is well known by visitors to the lakes as the "Old Man," being 2580 feet above the level of the sea. The soil on this northern range is better than on the eastern chain, and the natural drainage more rapid and complete than on the grit formations. On the western and southern sides of the county is found the new red sandstone, which forms an irregular band of some miles in breadth, extending along the vale of the Mersey, east of Manchester, to Liverpool, and thence along the western side by Ormskirk and Preston to Lancaster, and in this stratum is found the red marl, which is so valuable as a manure in reclaiming dry, sandy, and peaty soils; to the westward of this line lie the alluvial districts, and the coal-beds occupy the whole space between the red sand-stone and the eastern boundary of the county south of the Ribble.

Westward from the eastern chain of hills flow the three great rivers of the county, which, with their numerous tributaries, empty themselves into the Irish Sea. In the lowlands and valleys watered by these streams are found many parts favourable to a high state of farming, and we will now proceed to consider in order the three great divisions formed by these rivers, with reference to the subject of this report, commencing with

THE SOUTHERN DIVISION.

(No. 1.)

The soil throughout the whole tract of country between the Mersey and the Ribble, and between the sea coast and the first rising of the high hills to the east, is in general of a stiffish loamy kind, always excepting Chat-moss and its kindred wastes. Towards the sea-coast, to the west of the old high road from Liverpool to Preston by Ormskirk, there is a district of great fertility, being for the most port of a sandy vegetable loam, of considerable depth; and Mr. White, to whose evidence we have already referred in speaking of the general character of the South Lancashire land, says, "About two-thirds of it is strong clayey loam, upon a subsoil of clay; the clay requires under-draining before it can be properly culti vated." Throughout the whole of the lower districts of this division all sorts of grain are occasionally grown, but oats and wheat are the most prevalent, yet barley is frequently met with near the coast; potatoes are cultivated largely in the neighbourhood of Ormskirk and Warrington, whence great quantities are taken to supply the Liverpool and Manchester markets; and it is a fact in husbandry worthy of remark, that the first potatoes raised in England were grown in this county.

Turnips and the artificial green crops have been introduced within the last few years, and continue to be grown with increasing success; but, as yet, a regular and scientific system of cropping is rarely met with. Around the large towns the grass land is mostly preserved undisturbed, and the produce in milk and butter daily conveyed to supply their never-failing wants.

The only limestone found in this division lies in the extreme north-eastern corner, in the neighbourhood of Clitheroe: it is, in fact, the western side of the Craven bed, which here runs into Lancashire from Yorkshire, and will become most valuable to the whole of the southern division on the opening of the Bolton, Blackburn, Clitheroe, and West-Yorkshire Railway, now in course of construction.

On the eastern and hilly side of this division there is not much to interest a farmer: in the neighbourhood of Clitheroe and Whalley there is some excellent land, and the advantages of the limestone on which this district rests are sufficiently apparent both in the aspect of the country and the general produce of the farms: but from Whalley to Manchester, through Accrington, Haslingden, and Bury, and still farther to the east by Colne and Burnley, the land is mostly kept in pasture. This is altogether a coal district, and consequently a thickly-peopled one; the farmers find a ready sale for their milk in the towns and villages, and hence there is little stimulus to exertion. Draining is more or less required throughout the whole; the soil is a cold tenacious clay, and the country has a bare and dreary appearance: the land being divided into small properties and holdings, lets high; £2, £3, and £4 per acre being a common rent. A population such as the whole of this is, employed in hand-loom weaving and mills, is not likely to advance much in agriculture; still there are instances of improvement by the owners of the soil. Sir Robert Peel has drained almost all his land, to the amount of 1000 acres, in the neighbourhood of Accrington, under the direction of Mr. Josiah Parkes, at a depth of four feet, and at various intervals, with 1½ inch pipe, tiles, and collars, which are made at an old-established pottery at Oswaldtwistle, close to his property; other tileries are about to be erected in this district, which will tend to improve the quality and lower the price of this necessaay article.

On leaving the hilly districts and descending into the low country to the westward, the first important feature in an agricultural point of view is the cultivation of Chat-moss : this is a large bog or morass, situate about seven miles to the westward of Manchester ; it is five miles long from east to west, and about three miles broad from north to south, and covering an area of about 6000 acres. The Liverpool and Manchester Railway passes through, or rather over it, from east to west. Much variety of opinion prevails as to the origin of these mosses ; some carry their formation as far back as the general deluge, but the more probable theory is that they have been caused by the natural decay of primeval forests in the valleys or hollows, from which the water had no escape ; a few trees blown down or felled would readily choke up the outlet of a small stream with little or no fall, and when decay had once begun its ravages in a forest so situated, it would proceed with an ever accelerated rapidity until the whole was reduced to a mass of decayed or decaying vegetable matter.

The surface of Chat-moss is a sort of long, coarse, sedgy grass and heath, tough enough to enable a man to walk upon it in most parts ; but it was given in evidence by Mr. Giles, before the committee of the House of Commons, preparatory to the making of the Liverpool and Manchester Railway, that a boring-rod, when forced through the surface vegetation about the centre of the moss, would sink with its own weight to the depth of 34 feet. At that depth there was a vein of four or six inches of clay ; below that, two or three feet of quicksand ; and, at the bottom of all, hard clay which kept the water up. The same engineer gave it as his opinion that a railway could not with safety be made over Chat-moss, without going to the bottom of it ; but the late Mr. George Stephenson, with his usual engineering skill, preserved the surface untouched ; and, by laying some brushwood and hurdles upon it to make a foundation, and opening side-drains, carried the railway in safety over the top of this mass of bog, which varies in its depth from 10 to 37 feet. The railway, in fact, *floats* upon the moss.

Few men would ever have dreamt of cultivating such a waste as Chat-moss ; but Mr. Roscoe, of Liverpool, first commenced this great work by trying to drain 2000 acres. After a series of laborious and costly experiments, the chief fault of which was his desire to do too much, and to lay the open drains too deep and too far apart, he was compelled to give up the undertaking ; and it was reserved for Mr. Reed, assisted with the capital of a company of gentlemen, formed for the purpose, to accomplish the desired object.

This gentleman, in a very valuable essay, which gained the premium at the Liverpool Agricultural Society's meeting, in September, 1833, and was subsequently published by that society, has detailed the method he adopted to reclaim the moss, and to this day the abundant produce of the soil bears testimony to his complete triumph over its natural sterility.

The drainage was the first step to improvement : this was effected by cutting open parallel ditches 66 yards apart, four feet wide at the top, and sloping down to about fourteen inches at the bottom, and three feet six inches deep: in a wet floating mass like this moss it was not possible to sink the ditch to the whole depth at once, and the first two spits being taken out it was then left for time to consolidate the surface; the covered cross drains, ten yards apart, laid three feet deep, and running into the open ditches, were commenced, but in forming these, as well as the open drains, it was necessary to allow some time to elapse between the different operations, that the water might to some extent run off; the hollow drain was made by the top sod, dried by exposure to the air, being wedged into the open cut, and the peat thrown in again upon that to fill up.

When the surface was partially dried, the heath and other plants growing upon it were set on fire and burnt off as closely as possible; and, by ploughing and cross-ploughing, and cutting up the sods with a roller armed with knives, the ingenious contrivance of Mr. Reed, he was enabled to destroy the tough and elastic character of the surface: after this process, marl, which was found at the southern edge of the moss, was, by means of a moveable railway, laid on the top, to the amount of 100 cubic yards to the statute acre; the average distance which the marl had to be removed being about two-thirds of a mile. Whilst these operations were in progress, I went over the moss with Mr. Reed, and remember that both men and horses were obliged to work with pattens, or flat pieces of wood, attached to the feet.

By means of the Liverpool and Manchester Railway, then in full operation, Mr. Reed was enabled to bring from the latter town any quantity of manure; and he found that a mixture of night-soil and ashes was preferable to anything else. By growing a crop of potatoes in the first instance, the different particles of moss-earth and manure became so thoroughly blended together that the soil formed would produce anything, and wheat, clover, and oats followed each other in successful rotation. Since Mr. Reed left, some years ago, the management has been entrusted to Mr. Evans, now of the Haigh Foundry, Wigan, and it has been discovered by experience that it is not advisable to grow wheat or clover on such land: turnips, oats, and potatoes are considered the best crops; and instead of marl, which is both bulky and heavy to move, it is now ascertained that salt mixed with lime is the most effective instrument in destroying the mossy nature of the surface, and preparing it for a first crop of potatoes; these grow exceedingly well on *moss-lands unmarled*, but if marled, their failure is as general as on other soils. In Professor Johnston's recent work 'On the Use of Lime in Agriculture,' it is stated, chap. xi., section v., that "The use of lime and salt has been frequently recommended by Mr. Cuthbert Johnson and others; and its virtues, in the proportion of one of salt to two or three of lime, have more lately been experimentally tested and recommended by Mr. Huxtable. It seems to be particularly adapted to deep soils, as they are called ; to such as are covered with moss, and to reclaimed and drained peat-bogs."

There is still much of this moss in its natural state ; but, it is to be hoped that, lying as it does in the heart of a populous district, and traversed by a railway connecting together the two most important towns in the kingdom, it will not long continue so ; and that, with the example of what may be done, Chat-moss will in a few years become a cultivated plain, administering to the wants of an ever increasing population.

To the north-east of Chat-moss, and on the high land overlooking the whole of the lower part of Lancashire and Cheshire, is Worsley, the property of the Earl of Ellesmere ; within the last two years his Lordship has established a tilery, and drained a large portion of the Old Hall Farm with 2-inch pipes and collars, at 4 feet deep, and 10 yards apart. They seem to run well, but the land is stiff and heavy to work ; it produces good crops of wheat, oats, and beans : last year the turnips did not succeed, their failure being attributed chiefly to the constant rain in the summer of 1848 ; but they have been grown 25 tons to the statute acre, whilst the wheat sown by drill averages about 4 quarters, and beans 40 bushels. The milch cows, in number 25, together with the young stock, is decidedly above the average, and the milk is immediately disposed of in supplying the neighbouring villages of the district.

Near Newton, half-way between Liverpool and Manchester, on the London and North-Western Railway, there is a farm which deserves a passing notice, the property of Mr. Bankes, of Winstanley Hall ; it lies immediately to the eastward of the Newton Station, and on both sides of the railway, and is now in the occupation of Mr. Wilson. This gentleman was one of the first to set the example of draining in this part of the country, when living some years ago on a farm of Mr. Greenall's in Winwick. His present farm contains 250 statute acres, with a good house upon it ; but the farm-buildings are old, and quite inadequate to the wants of the present day. When he came to it, about two years ago, he found the land in a wretched state ; his first object was to get it all drained, and this he has nearly accomplished with horseshoe tiles and soles, which he obtains from a tilery close to Newton. The soil being a strong heavy loam, he has cut the drains 3 feet deep and 5 yards apart, but made no air-drain, and, with the help of some Irish workmen, he was enabled to do this at the cost of 4*d.* a rood of 8 yards, the tiles being laid by the day at 13*s.* per week ; he has grubbed up the old irregular fences, and filled up the ditches, so as to divide the farm, where practicable, into fields of about 25 acres each, or more. His plan is to plough up the old rushy sward for oats ; 2ndly, turnips, with farm-yard manure and guano ; 3rdly, wheat or barley, with seeds to remain as pasture for two, three, or more years, according to the price of corn or other circumstances. The land being foul for the turnips, he cleaned them by hand-labour for five or six weeks, and succeeded in getting a crop of Swedes, about 30 tons to the acre; in preparing the land for the turnips, he found the Norwegian harrow a most useful implement: he ploughs with a common iron plough and two horses, and sows for wheat 2 bushels to the statute acre. But he unfortunately lives under the shadow of a large chimney more than 300 feet high, which is continually vomiting forth its pestilential breath from some extensive chemical-works in the neighbourhood, to the certain damage of all vegetable life within its range, and that this is not confined to a small extent may be judged from the withering effects visible upon the trees for miles round. The nuisance occasioned by these works has been so grievous and intolerable to the whole neighbourhood, that the farmers, with Mr. Wilson at their head, have taken the matter up, and are endeavouring to form a Society for the protection of their interests, and the removal of such works, which certainly are most objectionable in the midst of an agricultural district. It is to be hoped that by the united efforts of both the landowners and occupiers this evil will soon be entirely suppressed.

Proceeding westward, towards Liverpool, we come into the neighbourhood of Knowsley; the soil here becomes lighter, and, resting upon a substratum of new red-sandstone, is more forward and more easily worked than the cold clays of East Lancashire. One of the most interesting farms on the Earl of Derby's property in this part of the country is Halewood, comprising 300 statute acres, and now occupied by Mr. Robert Neilson: this gentleman, since he took the farm about 10 years ago, has spared no pains or expense to render it one of the most complete and perfect establishments in the country, nor is it merely as gratification of a personal feeling, or the indulgence of a temporary fancy, that the system which he has adopted is to be viewed; he has been trying to work out, as a matter of business and practical inquiry, an experiment in which all the landowners and farmers of Lancashire are more or less interested. Expensive implements have been purchased by him, and used on the farm; a fixed steam-engine of 6-horse power is constantly at work in the different operations of cutting hay and straw, crushing oats, cutting turnips, sawing wood, and steaming all kinds of provender for horses, cows, and pigs. A small railway or tramroad has been laid down in the yards for the purpose of carrying the food to the animals and conveying away the manure to the dungheap, whilst a considerable length of light moveable railway, an invention of Mr. Neilson's, is used in bringing the produce of the fields to the farm-yard—in wet weather and on level ground, a most valuable expedient. If Mr. Neilson has done this as a farmer, it is to be hoped that the farming community may some day or other be put in possession of the results, or at least may be informed whether the balance is on the debit or credit side of the account. All the farm is drained with horseshoe tiles and slate soles, the latter being the refuse of the Welsh quarries. I was informed by the farm bailiff, who kindly took me over the farm in the absence of Mr. Neilson, that pipes had been tried; but they do not answer in that neighbourhood, inasmuch as the crevices become choked up with a kind of weed or the roots of plants—consequently their use has been abandoned. The drains are laid at a depth of 2ft. 6in. or 3ft. 6in., and the mains, where there is fall, 4ft., the space between the former being 7 or 9 yards. Wheat, oats, barley, beans, vetches, and turnips are all grown upon the farm; but potatoes have been given up. The course is as follows, with certain modifications according to particular circumstances:—

Wheat, by a broadcast machine on ribbed furrows, 6 to 8 pecks per acre.
„ if drilled, 2ft. 6in. apart, 4 to 5 pecks per acre.
Vetches, till June, and then transplanted with turnips.
Turnips and mangolds in drills 32 inches wide.
Beans, drilled.
Wheat or Barley.
Seeds for one year.

I was informed on the spot that one field of wheat, manured from the farm-yard, and sown by a broadcast machine on ribbed furrows, with a dressing of guano in the spring, produced last year 48 bushels to the statute acre, whereas that sown in drills 2ft. 6in. apart yielded from 32 to 36 bushels; I do not know whether or not this latter had any guano. A twenty-seven acre field of turnips also last year, after wheat, with farm-yard manure ploughed in with the stubble at the rate of 50 tons the acre, and afterwards 1½ cwt. of bones dissolved in sulphuric acid per acre, produced 40 tons of turnips to the acre; this was the first trial of bones with sulphuric acid, and the result most satisfactory. Both the drilled wheat and beans are sown by the same implement, which consists of a single box or covered barrow, fixed by an iron rod to the handle of a double mould-plough, at such a distance that the seed falls 1ft. 3in. from the furrow formed by the plough, which is drawn by two horses; one man of course holds the plough, and another the handles of the box, which runs on a wheel, and has a small spout through which the seed drops; the two men walk side by side, the box being kept in its place by the iron rod which fixes it to the plough, and this latter covers the seed, not of course as it is dropped, but in returning down the next furrow. I saw this simple machine, which is Mr. Neilson's own contrivance, at work, sowing beans, and calculated that the two men and two horses would sow about 5 acres in a day. Mr. Neilson has standing room for 100 head of cattle, of which from 30 to 40 are milch cows, the milk being sent to Liverpool, about 6 miles distant; he employs a large number of men and women in gangs of from 60 to 100, in hoeing, cleaning, and reaping, so as to get through the work rapidly, and 14 horses.

The rotation of crops in use by the farmers of the neighbourhood of

Halewood, was potatoes, wheat, turnips, and oats, with seeds or not ; but the failure of the potatoes has obliged them to adopt in some cases beans as a substitute : they have no implements of any importance.

Throughout the whole of the Earl of Derby's estates in this part of the country, most of the farms have been held on life leases, and are in the hands of men who have no capital to lay out—and no knowledge or desire to improve. The evil consequences of this system are sufficiently apparent on the surface, and as any of the old leases drop, the farms are now generally re-let on terms of years, and for any outlay in draining by the landlord the tenant is charged 5 per cent. From Knowsley to Ormskirk the road passes through a tract of mosses, Rainford and others ; a great part of this has been reclaimed by his lordship, and is about to be formed into a farm of 500 acres around the site of the old Mossborough Castle ; the feudal remains have disappeared to make way for a new and substantial stone farm-house, which, with the buildings proposed to be erected, will soon form an establishment more suited to the habits and wants of the present day ; the plough-share and the pruning-hook have here literally taken the place of the sword and spear of ancient days.

At Bickerstaffe Hall, Mr. Smythies, a gentleman from Herefordshire, occupies a farm of 380 acres, which he farms on a six-course shift—potatoes, wheat, turnips, barley, and seeds for two years ; the potatoes having for the most part proved a failing crop, he now proposes to begin with oats, then turnips, &c. : the old fences have been cleared away, and the fields made of proper form and size ; his buildings are large but not arranged on the best plan,—the old barn being retained, and part of the farm-stead in its original form, they are not so perfect as an entirely new set would be. Most of the farm was drained before he came to it, at a depth of 2ft. 6in., and on his first proposing to deepen that to 3ft. he met with little encouragement ; now, however, both here and elsewhere on the Derby estates the three-feet system is adopted.

In walking over his young wheat and seeds with him, I observed that some four-footed friends from the adjoining covers had been rather busy at his expense ;—in fact, winter vetches, one of the most valuable crops to a farmer, cannot be grown here.

Proceeding northwards, near Ormskirk, there is a farmer at Fairhurst, who, without a lease, merely a tenant from year to year, and occupying about 160 acres, spares no expense and pains in farming it on the best principles. The Earl of Derby, in approval and return for his exertions, has lately erected for him some new buildings (he carting the materials), which are quite deserving of notice as simple in their arrangement and well adapted to the means and wants of the practical farmer : the steaming and boiling-house is not yet built, but this will shortly be done ; and when completed, the whole will form a quadrangle, with a straw-yard for pigs in the centre, paved at the bottom, and about 23 yards square, enclosed by flags set upright and fastened together with iron bolts; this excellent material for the purpose is got from quarries in that part of the country. Between the straw-yard and the buildings there is a space of 5 or 6 yards paved all round; the shippon and stables are well ventilated at the top. When I visited this farm, four horses were at work thrashing with a machine, which the tenant has put up at his own expense.

The soil throughout the whole of this district is loamy and tolerably easy to work; still farther to the westward it becomes gradually lighter, till in the neighbourhood of Formby and Southport it is almost all sand. In many fields at Formby, near the shore, there is soil two feet below the sand, that lies beneath the greensward: it would seem that this soil, which is about four inches thick, was originally the surface, and has been buried at some former period by sand-drifts.

Near Rufford we get into the mosses again; which, however, have in a great measure been reclaimed: large fields, intersected with open dykes and watercourses, produce good crops of potatoes and oats, are now to a large extent laid down in permanent pastures and meadows.

The cart-horses throughout the whole of the western side of this division still preserve the character they bore in Mr. Dickson's time; the farmers take a pride in their teams, and as they were improving in his days they have continued to do so, till now it would be difficult to surpass them in any district of the kingdom.

Throughout the greater part of this division the manufacturing population predominates very much over the agricultural, and hence the tendency to small farms and holdings. The farmers as a class are inferior in position and education to those of other parts of the kingdom. The habit of taking two white crops in succession still prevails very generally amongst them, and the practice of laying down the land in narrow butts, often after wheat, and in many instances allowing it to grass itself over, cannot be too strongly condemned. The evils of the bad system which has prevailed for the last 50 years or more, are so manifold, and the prejudices of the people so deep-rooted, that it will take many years to eradicate them, and raise the agriculture of this part of the county to its proper position.

MIDDLE DIVISION.

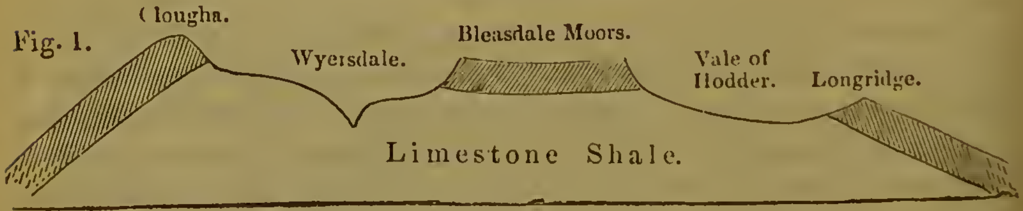
(No. 2.)

On crossing the Ribble to the north, and passing through Preston, we at once leave the manufacturing districts; they belong to the Southern Division, for, excepting Preston with a population of 50,000 souls, and Lancaster with 15,000, there is no town of importance between the rivers Ribble and Lune. Preston is of course a manufacturing place, and, being situated on the extreme southern verge of the Middle Division, may fairly be allowed to belong to the Southern; and Lancaster, though it has produced a few tall chimneys, cannot find in them much to be proud of, they are evidently exotics, they do not thrive as in the south, nor increase in number; coals are brought from a distance, and the old county town, with its ancient castle and quiet sombre-looking streets cannot in the nineteenth century be classed amongst the busy and bustling scenes of manufacturing industry.

We are therefore now in a purely agricultural district; the whole appearance of the country is changed: the trees, no longer blackened and begrimed with the smoke, wear their natural colour; the air is pure and the sky clear; and the ruddy looks of the inhabitants plainly testify that they do not live in mills, nor pass the best of their days in driving the shuttle. Tall and strong of limb, and intelligent in countenance, there certainly is no physical hindrance to their being as good farmers as any in England.

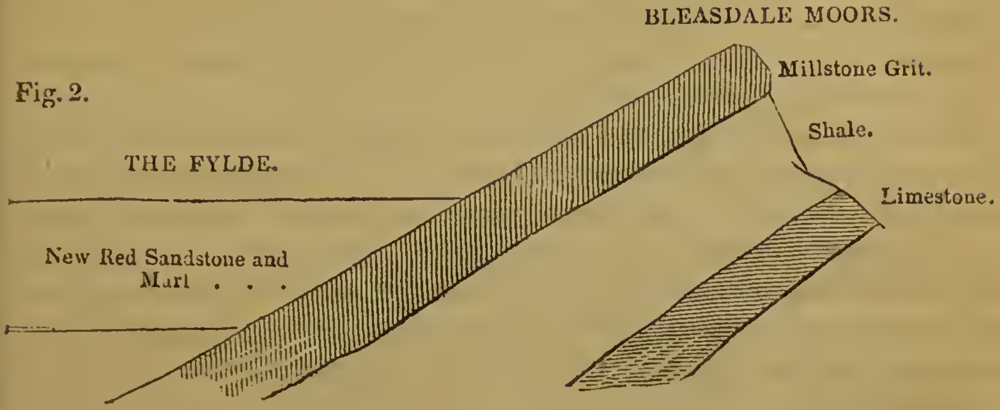
The soil of this division, on the eastern parts and mountainous slopes of Longridge, Bleasdale, and Wyresdale Fells is thin, and of a black moorish nature; the lower portions of the sides of the hills and the valleys formed by them are commonly somewhat of the nature of the holms, with brooks, and rivulets running through them. At the foot of the hills and through the townships of Goosnargh, Barton, and Claughton, and for the most part along the line of the Preston and Lancaster Railway, the soil is of a stronger quality, in many parts amounting to a stiff clayey loam. The Fylde is that tract lying to the westward of the above-named railway, and bounded by the Ribble, the sea, and the Lune; in this low-lying country almost every kind of soil is found, from a stiff clay to sand or bog, but the greater part is clayey loam and alluvium, intersected in many parts with large and deep mosses, such as Pilling, Rawcliffe, Nateby, &c. To understand the nature of the soils of this division, and the geological relations of Clougha (the northern ridge of Wyersdale), Bleasdale Moors, and Longridge with each other and with the Fylde, the annexed sketches taken from Professor Phillips's 'Report on the Vicinity of Lancashire,' may be of service; all the hills are capped by lower millstone grit, resting on the limestone shale; this section is made on a line drawn from north to south:—

Fig. 1.



This other section is made on a line drawn east and west :—

Fig. 2.



The only limestone fit for agricultural purposes found throughout the whole of this division is in the neighbourhood of Chipping, a village seven or eight miles north-east of Preston, in the valley which separates Longridge Fell from Bleasdale Moors ; it is extensively used in these parts as a top-dressing to the grass-lands and sheep-pastures, and with good effect. The cost at the kiln is 11*d.* a windle, and two windles are equal to 3 cwt.

The *inhabitants* of the hills are a manly and independent, but rather uncultivated, race ; shrewd enough as far as their own immediate interest is concerned, but incapable of looking forward ; unwilling to lay out *sixpence* this year in the chance of receiving a *shilling* next, and jealous to an extreme of any alteration or innovation on the customs of their fathers. Many families have lived on the same farms for generations ; and by frequent intermarriages they have become connected together almost like one family, and, with a strong attachment to their native hills, care little to receive or visit strangers.

Their farms are not large ; some of the most important amount to 250 or 300 statute acres of enclosed land, with a large right of sheep-pasture over the moors adjoining, and held for the most part on yearly tenancies. The stock on the farm is generally all the capital they possess, which consists of a herd of milch-cows and their calves of different ages, little or no care being given as to the breeding of them ; a flock of black-faced sheep of very inferior quality, and a pig or two, with perhaps a couple of horses when the farm is large, make up the total of their property : they generally keep their land in grass, with a plentiful crop of *rushes* which serve, *as they say,* "to keep it warm ;" or if they plough it up and take a crop of oats, which is the most they ever aspire to, they leave it to time and nature to grass it over again, and never think of *putting any manure on ;* this is all preserved for the meadows, which are really of importance, inasmuch as they produce the hay which is to keep the stock through the winter. The hay-harvest is therefore the most critical time of the year, and they give it all the attention they are capable of. They mow with large scythes, 5 feet or 5 feet 6 inches long, very heavy, and therefore slow in action, and they shake out the swathe, not with forks or any implement, but with the hands. The climate being precarious and the population small, the hay-making on a moderately-sized farm takes a month or six weeks, part of July and August, and as it is made it is secured in close barns, not in stacks or open sheds : two tons to the acre is a good crop. The produce of the cows is made into cheese and butter, mostly the former, and the whey given to the young calves. They have no green-crops nor farm-yards for turning the cattle into and preserving the manure during the winter. Simple and hardy in their habits, they have few wants beyond the actual necessaries of life ; their houses are built of the rough gritstone of the country, and the turfs on the moors adjoining serves the purpose of fuel. Wheaten bread is a rarity ; and the bake-stone, or hot hearth, for baking the large oatcakes upon, forms a necessary appendage to the farmhouse and the cottage ; in fact this is the case throughout the whole of North Lancashire. The oatcake is still the favourite food both of farmers and labourers.

Draining, wherever it has been attempted, has been done sometimes with sods, but more commonly with stones, the natural materials of the country : the drain is made in the form of a sough, with rough stones, at a depth in some cases of 28 inches, but for the most part not more than 18 or 20 inches, and carried across the falls at intervals of 9 or 12 yards, with just sufficient inclination to allow the water to flow, the object being to prevent thereby any scour of the subsoil. Some fill the drains half with the soil taken out and half with broken stones, and carry the latter up the surface on the higher side of the drain, so that the surface-water may run into the drains as into a spout at the eaves of a house—a most effectual means, by the way, of carrying off all the small particles of manure whether lime or anything else that may be lying there. This mode of draining cost 15*d.* per rood of 7 yards, but is gradually giving way to a better system ; and the introduction of pipe-tiles enables the drains to be carried in safety down the fall at a greater depth and at less expense.

On descending the hills the style of farming begins to improve, and both the soil and climate admit of more attention being paid to arable culture, and with greater success than in the high lands. Still, with the exception of a few large landed proprietors, such as Mr. Brockholes, of Claughton Hall, and Mr. Jacson, of Barton, there is little improvement on the old system, and the dislike to alteration prevails here as elsewhere.

The fields in many parts for whole districts bear the appearance of having been ploughed till they could produce nothing, and the miserable herbage with long rows of rushes in the furrows show too plainly the great want of draining and management in the occupiers. Mr. Brockholes has, during the last twenty-eight years, since he came into possession of the property, drained upwards of 2000 acres, chiefly with stones and across the fall: many of the drains were first laid out by himself so level that they have been choked up by the deposit of ferruginous matter, called *canker*, and require now to be done over again with tiles and on a better system. His soil is for the most part a stiff clay, and he does not approve of draining in such cases deeper than 3 feet. Being a constant resident, he is able annually to lay out large sums in improving his estate, and spares no pains in making it one of the finest in this part of the county.

On the property of Mr. Jacson, which lies between 4 and 7 miles north of Preston, a series of improvements was effected during the lifetime of his father, who will long be remembered in that district as a real benefactor in his generation, and his son continues to follow in his steps, endeavouring to recover a fine estate from the effects of former bad management. On a property of 2600 acres nearly thirty sets of farm-buildings have been rebuilt (at a cost of 27,000*l.*) within the last sixteen years, or so renewed that it amounts to the same thing; and instead of the old houses made of mud walls and thatched roofs, may now be seen throughout the whole of it good substantial tenements built of brick and covered with slate. They are decidedly above the average of farm buildings, and though not adapted to the use of steam-power or any other of the modern scientific improvements, are justly deemed well suited to the means of those who occupy them.

The farms are not large, the most important being from 180 to 200 statute acres, but the average is about eighty; they were formerly let on yearly tenancies, but seven years is now the usual term, and some of the farmers are willing to enter into agreements for ten, but for the most part they are reluctant to bind themselves for so long a period. As a class they are incapable of estimating the responsibilities which the covenants of a lease entail upon them; in their anxiety to get the farm, they are willing to enter into conditions the force of which they do not understand, and which constantly they care not to fulfil; wanting in capital and energy both of body and mind, they are unable to appreciate or carry out an improved course of husbandry, and looking with suspicion on any plan which seems to differ from their own method, are reluctant to abandon the practice of breaking up the land for successive grain crops; to preserve the greater part of the farm in grass is the aim and object which a good farmer ought to have in view throughout this district, but after such a process of exhaustion as the land has suffered during past years, it is impossible to restore it to anything like vigour without going through a judicious rotation of crops, and the system of the shedule, tried on this property, which binds the tenant to a fixed and regular course, though at first greatly disliked by him, is the only mode of accomplishing the object sought after. The rental of the land averages 30*s.* per statute acre, or rather more, and the rotation of crops, which is now adopted with success in working and restoring it, is a five-course, as follows :—

Out of ley—1. Oats.
2. Oats, a better crop than the first.
3. Green crop manured, turnips or potatoes.
4. Oats or barley, with seeds.
5. Seeds for hay or pasture.

And after that one year or more in pasture, according to circumstances, the object being to get a good permanent pasture for the dairy, and sometimes it is preserved unbroken for three years. The land is strong and retentive of moisture, and produces after a fallow, a good crop of wheat, 25 or 30 bushels to the acre ; but before any of these crops can be grown, it is necessary to drain it thoroughly. The first method of draining on this property, before the invention of pipes, was with horseshoe-tiles and stones, at a rate varying from 15*d.* to 18*d.* a rood of 7 yards, total cost, filled and completed, and 60,000 roods of drains were laid at a depth of not more than 30 inches ; but now a drain of 3 feet deep with a 2-inch pipe for the water, is found to answer admirably at intervals of 8, 9, or 10 yards, down the fall, at a cost of 11*d.* to 13*d.* per rood, including the tiles, cutting, laying, and filling. The understratum in which the tiles are laid is a stiff reddish clay, capable of being made into bricks or tiles ; and the drains are, for the most part, laid 8 yards apart, with an *air-drain* carried along the top of the field, and communicating of course with the heads of all the drains. This admission of a draught of air is most advantageous, and may, in fact, be considered as *one of the great secrets of thorough tile-draining :* in meadow land, or permanent pasture, it is quite sufficient to bring the pipe up in a slanting direction to the surface ; this plan I have *tried,* and it saves the expense of the additional air-drain.

A large brickyard and tilery has been at work on this property for more than 15 years, and the horseshoe-tiles were made in large quantities, as may be imagined from the length of drains named above, which was generally laid with that kind of tile, the opening turned upwards, and a stone placed as a cover. For the last three years pipes have been substituted for the horseshoe ; and last year, 1848, upwards of 500,000 tiles were made in that yard, nor was this supply at all equal to the demand. There are two machines at work, Whitehead's and Clayton's, but the latter was used first, and I believe continues to be the favourite for large tiles, though the former is preferred for the smaller kinds.

From Barton, proceeding westward, we pass into the Fylde, which is divided into two parts by the Wyre ; this river rises at the head of the valley that takes its name from the stream, and flowing by the small town of Garstang, passes thence with a considerable detour near the villages of Church Town, St. Michael's, and Great Eccleston, and finally empties its waters into the sea at the south-west corner of Morecambe Bay, forming there a harbour to the modern town of Fleetwood. The southern of these two divisions is much the larger of the two, but nearly all the mosses of this part of Lancashire lie to the north of the Wyre, and their history and present state must form one of the most interesting subjects in any treatise on the farming of the county. These original wastes may be roughly estimated at 20,000 statute acres, and from a state of perfect sterility, producing nothing but moor-fowl and snipes, they are now being gradually converted into the most productive lands in the kingdom; this has been chiefly done by a good system of draining, and it is remarkable that the levels of this country should fall to the north. From within half a mile of the Wyre the water falls to the Lune, and from within two miles of the Ribble it runs into the Wyre, from which it is evident that to drain these districts thoroughly and to keep them in working order, it is absolutely necessary that the beds of these rivers should be kept as low as possible. From the constant washings from the hills and from repeated floods they bring down with them great quantities of sand, which, as the rivers widen towards the sea, and become more sluggish in their course is deposited in the channel, to the manifest injury of the outfalls above. The natural scour is not sufficient to keep the rivers deep to the sea, and it is very necessary in any general drainage measure that particular attention be paid to this point. It is strange that Ireland should possess the Acts of 1 & 2 Wm. IV., cap. 57, and 5 & 6 Victoria, cap. 105, "To empower landed proprietors in Ireland to sink, embank, and *remove obstructions* in rivers;" and that England should be at this day without the benefit and power of any such laws. It is much to be hoped that this defect will soon be remedied.

Each division of the Flyde has its great landowner and improver: Mr. Clifton, of Lytham, in the southern, and Mr. Wilson Ffrance, of Rawcliffe Hall, in the northern; and both these gentlemen have indeed "deserved well of their country" for their eminent services in the cause of agricultural improvements.

The climate of the whole of this lowland district is much milder than in the higher parts of the Middle Division situated to the eastward; and the town of Lytham, at the mouth of the Ribble, has become, in consequence of its peculiar situation and warmth, a favourite place of resort during the winter months. The soil for the most part south of the Wyre is rich and loamy, lighter than on the eastern side of the Lancaster Railway, and eapable of growing any crops, and when drained most productive. Towards the sea-coast, from Lytham to Blackpool and Fleetwood, the red marl prevails: but to the north of the Wyre it is almost entirely peat and moss resting on a substratum of marl and elay.

The character of the people and size of the farms aro very similar to what has been already described of the lower part of this division, in the neighbourhood of Barton, &c.; but the Earl of Derby and Mr. Clifton, who owns a large tract of country in this district of the Fylde, have done much towards their improvement. The latter gentleman especially has endeavoured to introduce upon his property a higher system of farming, before unknown there, and with the help of his intelligent agent, Mr. Fair, has certainly accomplished great things. He established a private Agricultural Society, which gave a stimilus to improvement amongst his own tenantry, that has been attended with much good; the stock exhibited gradually improved, and the green-crop system has been successfully tried, and the example thus afforded of what might be done with care and skill has not been without its effects beyond the limits of that Society. Large dykes and drains have been made to carry off the water to the Ribble; one especially, which extends from five to six miles, was made at an expense of 3000*l.* entirely by the proprietor; and as a proof of the benefit resulting from this work, offers were immediately made of an increased rent, which would bring some return for the outlay, and gave encouragement for further similar undertakings.

Mr. Clifton, in carrying out his views, has also introduced from Scotland men of capital and position as tenant-farmers, such as were unknown before in this county; and by giving long leases of 19 or 21 years on large farms of 400 acres or more, has effected a change which promises to be very advantageous; but it yet remains to be seen whether or not, as a whole, the Scotch system is the one which is most calculated to suit this part of England. Mr. Begbie, one of these gentlemen, has kindly furnished me with some particulars relating to his own farm near Lytham, which are worthy of notice. Part of his farm he has drained 2 feet 6 inches deep; but during the last two years no drains have been made less than 3, and some 4 feet; the 3-feet drains being 6 yards apart, and the price paid for cutting and filling 5½*d.* to 6*d.* per rood of 8 yards. The 4-feet drains are generally placed 12 yards apart, and the price for cutting, &c., 8*d.* per rood; these latter have only been made when the subsoil was open and porus. The last year he has used the pipe tiles with collars, 1¾ inch wide; but up to that time the horseshoe-tiles, with turf for a covering, or even turf alone, which forms an excellent drain when the subsoil is sound and stiff. Mr. Clifton supplies the materials and the tenant does the rest of the work, or Mr. Clifton does the whole, and charges a per centage. Hitherto Mr. Begbie has not been able, from the unformed state of his farm, to carry out any regular course of cropping, but now he proposes to adopt the seven-course shift, viz.:—

1st year, one-seventh of turnips.
2nd ,, ,, wheat or barley.
3rd ,, ,, grass and pasture.
4th ,, ,, pasture.
5th ,, ,, oats.
6th ,, ,, beans, drilled.
7th ,, ,, wheat.

The climate of the Fylde he finds to be wet and uncertain in autumn and winter, but good in spring and summer. He has a steam-engine of six-horse power for threshing and bruising corn, which can also be adapted to crush linseed without any additional power, at the same time with the threshing. Thick sowing for wheat is not so much in use here as elsewhere; 5 pecks in the autumn, until the middle or end of October, and 6 or 6½ as the season advances, are commonly sown, and many persons at *the beginning of autumn sow under a bushel per statute acre.*

Two tileries have been established on this property: one, the largest, has been at work for some years past; and a second smaller one was erected last year.

From Lytham we must go to Rawcliffe, and examine the mosses to the north of the Wyre: a dreary country it is in its natural state, but the hand of man and the blessing of Providence upon his exertions are fast converting this wilderness into a garden; oats and potatoes, turnips, and even wheat, may be seen growing in the greatest luxuriance on the surface of a bog, perhaps *thirty feet* deep or more, for in some parts the moss is found to exceed even this, and the black peat-stacks of turf reared to dry for fuel may be seen standing in gloomy contrast with the smiling produce of the sickle.

To enter fully into the details of the method by which this extraordinary revolution has been effected would of itself require an Essay; but the limits of this Report will not admit of more than a full statement of the facts: nor is there space to enter upon the very interesting question of the formation and origin of the moss—that belongs more to the geological inquirer—our business is with the surface; but it is worthy of a passing remark, that large remains of oak trees, sound, and black as ebony, and of a size equal to the timber of the tropics, are found embedded under these mosses, as well as large horns of the red deer and elk.

The cultivation of moss-lands appears to be the original farming of Lancashire; that is to say, that branch of farming in which it has a peculiar character and position, differing from the other parts of the kingdom: Lincolnshire has its fens, Yorkshire its wolds, and other counties their distinctive characteristics; but Lancashire has its mosses, and whilst in growing turnips or wheat we are only doing what others can do equally well, or perhaps better than ourselves, to produce these crops upon the surface of a barren moss, varying from 3 to 30 feet in depth, is a triumph in agriculture—such as no other county, I believe, can lay claim to.

The value of moss has been long admitted; as far back as 1819, Mr Nimmo says—

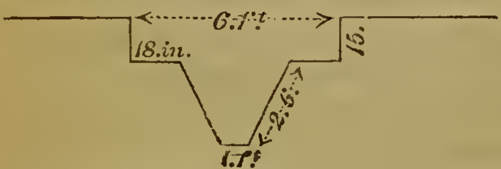
> "I am perfectly convinced, from all that I have seen, that any species of bog is, by tillage and manure, capable of being converted into soil fit for the support of plants of every description, and with due management perhaps the most fertile that can be submitted to the operations of the farmer."

And Sir H. Davy says—

> "A soil covered with peat, is a soil covered not only with fuel, but also with manure; it is the excess of manure only which is detrimental, and it is much more easy to destroy than to create it. To cultivate a bog is a much less difficult task than to improve a sand. If there is a proper level to admit of draining, the larger the scale of operations the less must the comparative expense be, because machinery may for many purposes take the place of manual labour; and the trials which have been already made by private individuals, and which are stated in the different reports, prove not only the feasibility of the general project, but afford strong grounds for believing that capital expended upon it, after mature and well digested plans, would in a very few years afford a great and increasing interest, and would contribute to the wealth, prosperity, and population of Ireland."*

Now in converting moss into land the first matter to be considered is the *main drains* and these must be determined on with reference to the extent, form, and situation of the moss, to the levels of the lands by which the moss is surrounded and likewise to the levels of the *subsoil* on which the moss rests.

Roads, having open drains on each side, must be made as a general rule 7 yards wide, and must be laid out so that the fields and their divisional drains run at right angles with the lines of the roads. The open drains on each side of the roads, are made for the first year 3 feet wide at the top, 1 foot wide at the bottom, and 4 foot deep ; but in the second year, when the moss is sufficiently consolidated, it is desirable to make these drains 6 feet wide at the top : at 18 inches from the surface this width of 6 feet is contracted to 3 feet by a square ledge of 18 inches on each side, so that a section of the drain is of this form. This additional cutting my increase the cost 2*d.* per rood ; but it has been found that the ditches so cut stand better than the old drains 3 feet wide, inasmuch as the superincumbent weight being removed, the drain is not so likely to spew up *at the bottom,* for it is not so much the sides falling in from the top as the *pressure from the bottom* that injures a ditch of this kind. The stuff taken out of the drain is thrown into the centre of the road, and when tolerably dry and ready for sanding, the road is formed, and sand or gravel laid on 12 feet wide, 4 inches thick in the centure and 7 inches on each side, the object of this additional weight at the sides being to keep them down.



The moss should be laid out in fields of 300 yards long, and 66 broad. This form contains 19,800 square yards, or 440 square yards more than four statute acres ; a little more than 2½ acres customary, of 7½ yards to the perch. Each field takes two end drains and one side drain ; and the covered drains in the field should be ten yards apart, so that one field of about four acres has one side drain, two end drains, and 28 covered drains. The expenses of draining are calculated after the rate of eight yards to the rood, as follows :—

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* For this testimony see Irish Farmers' Magazine, No. 29, March, 1836, p. 100.

2 end drains	16½ roods of 8 yards
1 side do.	37½ do. do.
	54 roods.

These end and side drains to be—

3 feet wide at the top,
1 foot do. bottom,
4 feet deep,

being the size of the open drains at the sides of the roads, &c., for the *first year*, and the mode of work and price as follows :—

	Inches.		£	s.	d.
1st sod, deep	14	5½d. per rood, for 54 roods...	1	4	9
2nd do. do.	10				
	24				
3rd do. do.	12	3s. 6d. per 100 yds. for 54 roods	0	15	2
4th do. do.	12				
	48		£1	19	11

The 5½d. per rood includes the throwing the stuff from the sides of the drains on to the road, or into the field, and chopping it.

Cutting the ledges, 2d. per rood, for 54 roods ...	0	9	0	2nd year.
	£2	8	11	

The form of a covered or field drain is—

14 inches wide at the top,
6 do. bottom.
3 feet deep.

and to be worked thus—

1st sod, 14 inches deep	7d. per drain.
2nd do. 10 do.	6 do.
3rd do. 12 do.	11 do.
36 inches	24d. per drain.

The first sod makes the wedge-sod, and when dry will be nine or ten inches thick; when taken out it is put on its side on the right of the drainer to dry, and the second or third sods are thrown out to the left. and chopped to fill up the drains when wanted: pattens are used by the workmen, as on Chat-moss. The breadth of field is already fixed at 66 yards; but it is calculated as 8 roods, or 64 on payment, so that one covered drain cost 2s., or 3d. per rood, and the 11d., being the third charge, includes the returning and fixing the wedge-sods, and filling up the drain, &c.

The whole expense of draining a moss field, rather more than four statute acres, will be as follows :—

1 side drain, 37½ roods of 8 yards.
2 end drains, 16½
——

	£	s.	d.
54 roods	2	8	11
28 covered drains, at 2s., being ten yards apart	2	16	0
Total expense for 19,800 square yards	£5	4	11
Per statute acre, 4,840 do. about.........	£1	6	2
Per customary do. 7,840 do. about.........	£2	2	0

The expenses of the main drains and the roads must be charged to the whole moss drained.

For the above particulars, and any others connected with these mosses, I am indebted to the kindness of Mr. Wilson Ffrance, of Rawcliffe Hall.

This gentleman had allotted to him, about nineteen years ago, 736 statute acres of moss, which he immediately set to work to improve ; it is now all under cultivation, producing beautiful crops of oats and potatoes, except eight acres upon which the drainers are now employed. He has drained it all on the plan given above, made roads, &c. ; and, after draining, marl (which is found under the moss) is laid on the top, at the rate of 150 to 160 tons per customary acre, by means of a moveable railway, as on Chat-moss.

The marl is calculated by the fall, which is 64 cubic yards ; 1 and ½ fall to the customary acre. The cost of this is thus estimated :—

Fall of marl ... ... 64 cubic yards.
1 cubic yard weighs 32 cwt.
——
128
192
——
1 fall = ... 2048 cwt.
½ „ = ... 1024 „
——
1½ „ = ... 3072 „ or 153 tons 12 cwt. to the acre.
1 waggon takes... ... ... 23 cwt.
134 waggons take... ... ... 3072 „

One horse will draw 35 waggons a day, generally taking 2 waggons at a time, in summer ; the marl-pit being a quarter of a mile from the moss-field.

35 waggons × four days, = 140 waggons.

	£	s.	d.
2 men in pit 4 days, at 2s. 6d.	1	0	0
2 men in field, spreading, &c., 4 days, at 2s. 6d. ...	1	0	0
1 boy driver	0	4	0
1 horse	0	12	0
Oil and extras..	0	4	0
	£3	0	0
1 fall and ½, or 96 cubic yards of marl, at 7d. per yard	£2	16	0

which is about the price; for it does not take quite 4 days, nor 140 waggons; and therefore the cost of draining and marling, with about 153 tons of marl, one customary acre of 7½ yards to the perch, is £4 18s., being about £3 per statute acre.

To carry all the water from the extensive area of Rawcliffe-moss, and others adjoining, it has been necessary to open a large dyke, five or six miles long. This little canal is made by a circuitous course to fall into Morecambe Bay, passing through Pilling; but so flat is the country, that it has not more than seven or eight inches of fall in a mile. The cost of keeping this dyke clear is paid by the proprietors, through whose land it successively passes.

The moss-land is found to produce the best potatoes of any known; and whilst in other soils the failure of this crop has been a total or partial loss to the cultivator, the moss-farmer is reaping an abundant harvest. On the customary Lancashire acre he can get

	£	s.	d.
60 loads of large potatoes, at 10s.	30	0	0
20 „ small „ at 7s.	7	0	0
	£37	0	0

One load being equal to 240 lbs.; and the above price is taken from the average of the first six weeks in this year in Garstang market. The present price is 13s. 6d.

As may be imagined, it is not difficult to let such land: an instance of the value in which it is held occurred not long ago on a property adjoining that of Mr. Ffrance. A man of the name of Fawcett took a farm of 36 customary acres, (about 60 statute), for £73 per annum, and sublet 12 of the 36 at £6 per acre, thereby keeping for his own use and occupation 24 customary acres, at a rental of *one pound* per annum.

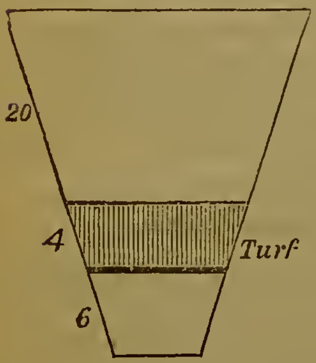
Another man, who came as labourer from Chat-moss, a few years ago, and is commonly known as "Chat-moss Joe," now holds a farm under Miss Harrison, at £70 a year, and the value of the whole 736 acres belonging to Mr. Ffrance may, on the lowest calculation, be estimated at the annual rental of £1 per acre, which, on an outlay of £7000, is rather more than ten per cent. The moss, when reclaimed, is let in lots by ticket, subject to certain conditions, one of the most important of which is, that the tenant shall keep the divisional ditches open on the side and ends of his allotment, to the full width of six feet at the top and four feet in depth; and, in case of failure, the landlord to have the right to re-enter. Not longer ago than the 19th of December last year, an allotment of 2a. 2r. 5p. of customary measure, equal to about four statute acres, was let by Mr. Ffrance for £8 per annum; and for another, rather less, as much as £12 was offered;—such is the competition for this kind of land during the present value of potatoes.

But Mr. Ffrance is not content with draining the moss itself; he also makes it subservient to the draining of the lands adjacent. In a letter to the editor of the "Mark-Lane Express," dated January 1st, 1840, he describes the process of making turves from the moss, which in a clayey subsoil were found to answer almost as well as tiles. He says, "The turves are cut from the peat where the moss cuts fibrous and tough, which usually may be six or eight spits deep: below that depth lies a blackish-brown turf, the moss being in a more advanced state of decomposition, and such is not considered so well-adapted for making draining-turves." The turves are cut with a spade made with sides twelve inches long, the sides five inches in depth, seven inches wide at the top, and tapering to six inches wide at the bottom.

"The expenses of completing the turves ready for use have hitherto been,—

	s.	d.	
Cutting the draining turf	2	0	per thousand.
Wind-rearing ditto to dry...	0	3	"
Stacking ditto	0	6	"
Total	2	9	"

In consequence of the moss drying up, and some becoming shapeless, 28 turves upon an average will drain a rood of seven yards; the cost of the 28 turves being (at 2s. 9d. per thousand) nearly 1d."



He then describes the drains made by him as thirty inches deep; eleven inches wide at the top, and tapering to two and a half inches wide at the bottom, the underside of the turf when wedged in being about six inches from the bottom of the drain; and calculates that the cutting, laying, and fitting in the turf can be done for fourpence a rood of seven yards; so that the whole expense of draining a statute acre will amount to £1 15s., the drains being ten yards apart:—thus,

	s.	d.
28 turves for one rood of seven yards	0	1
Cutting drains, laying and fitting in the turf	0	4
Cutting turves to the field and clay from the drains	0	1
For one rood	0	6

A statute acre, say 70 × 70 (4900 square yards) has 7 drains, 70 yards long each, = 70 roods = 35s.

These drains have been known to last perfectly sound in clay for 50 or 60 years; and, saving vermin, there is no reason why they should not continue efficient for a much longer period.

Mr. Ffrance has, within the last two years, established a tilery on his property: he now drains his clay lands with tiles 3 feet deep, and instead of using collars places a turf *under* the joints of the tiles where necessary, and turves over the pipe-tiles to *cover the crevice,* and relieve the tile from all pressure. This mode of using tiles and turves together does, in fact, make a double drain, which, under all ordinary circumstances, is not likely to get out of order; and the cost of the turves over and above the tiles is not more than five shillings per thousand, including carting, &c.

The custom of paring with a push plough, and burning the moss for oats after draining, prevails amongst the tenant-farmers in this district, and they pursue this for two or three years in succession; then, for a change, take a crop of potatoes or seeds, always burning the surface till the moss is reduced in thickness. On a farm of the Duke of Hamilton's, on Nateby-moss, with which I am acquainted, the practice is, after draining, paring, and burning—

1. Oats—if dirty, the burning repeated;
2. Green crops, turnips, potatoes, &c., with farm-yard manure and guano;
3. Marled and ploughed for spring wheat or barley; and
4. Seeds for mowing or pasture to lie one year, and then pared and burnt again for oats as before.

Proceeding northward towards Garstang, and from thence to Lancaster, we come into the extensive property of the Duke of Hamilton, which, from the woods of Ashton Hall to the moor-lands of Barnacre and Wyersdale, includes a large tract of country. Under the superintendance of Mr. Lamb great improvements have been effected on this property, and in a district containing so great a variety of soils and situations as this does, it requires no ordinary skill to adapt to each the proper treatment.

Eleven years ago the Duke of Hamilton established the Ashton Agricultural Society, for the purpose of offering encouragement to exertion amongst his own tenantry: the premiums were confined exclusively to them; whilst by the adoption of open sweepstakes a general competition was also admitted. This Society still flourishes; and the effect has been very beneficial, not only to a great majority of the Duke's tenantry, but to the whole of this part of the country. To assist in the improvement of the stock, his Grace has purchased within the last few years, several bulls of first-rate pedigree, at prices varying from 40*l.* to 60*l* and 80*l.*; and calves at less prices. Three of these bulls have been regularly kept on the estate, and are replaced as occasion requires.

Both the standard of stock and general management of farms have been greatly improved. Amongst other results Mr. Lamb has informed me that there has been a great increase in the growth of turnips; in fact, one farm now produces as much as the whole estate did eleven years ago.

On the low lands, where a regular system of arable culture is admissible, the following rotation of crops is now adopted:—1st, oats; 2nd, turnips; 3rd, barley, and grass seeds, to remain in pasture for two or three years. On the higher lands, exposed to the severe winds and storms from the westward, and where the soil is poor, the meadows and pastures are generally preserved unbroken. Mr. Curtis, who occupies the Heald—a high farm in Barnacre, of 109 customary acres, equal to 180 statute, and at an elevation of 500 feet above the sea—has tried a course of oats, turnips with guano, and oats with seeds, with tolerable success. He does not recommend Swedes in the high moorish soil, as, from his experience they do not keep well.

The draining on the whole property is done on a very extensive scale ; in 1847, 50 miles of drains were cut ; and in 1848, not less than 62 miles at the following rates, and at depths varying from 3ft. 6in. to 5ft., with 2-inch pipes, and 3-inch ditto for main drains :—

	ft.	in.		*s.*	*d.*	
Cost at a depth of	3	6	... ...	0	9½	per rood of 7 yards.
„	4	0	... ...	1	0	„
„	5	0	... ...	1	6	„

the width between the drains being 7 or 8 yards. The prices vary, of course, according to the substratum, but these are generally paid for the cutting and filling. To this must be added the cost of the tiles, which is 19*s.* per thousand for 2-inch bore, and 30*s.* ditto for 3-inch ditto, and the laying them, which is done by the day. To accomplish the draining on this estate it was found necessary to erect a tilery in the spring of 1845, which has been in active work ever since, the supply of pipe-tiles being by no means equal to the wants of the district. During the last year, 1848, 598,617 tiles and 33,029 collars were made there by Clayton's machine.

The farms vary in size, from 20 or 30 acres to 460, which is the largest on the property, the rent varying from 10*s.* to 50*s.* per statute acre ; the majority are held on yearly tenancies or on terms of 7 years, and some have leases for 14 years.

In the township of Nateby the land has been let on an oatmeal-rent since the year 1822, or in other words, the rent varies according to the price of oatmeal ; and at Cabus half the rent is paid in wheat and half in money : these customs are peculiar to these townships. In a farm at Nateby, to which I have already alluded, of 151 statute acres, the variation in two years has made a difference of 70*l.* in the rent. In 1848 it amounted to 190*l.* ; whereas in 1847 it was only 110*l.*, the rental being reckoned according to the price of oatmeal the previous year.

Mr. Ford, of Ellel, and Mr. Richard Hinde, of Lancaster, at his farm on Ellel Moor, have both set a good example in their several districts : the latter gentleman deserves especial mention before we leave this division ; for in Mr. Dickson's Report (p. 194) it is said of the improvement attempted there, that they had *failed* :—" Ellel Moor, near Lancaster, notwithstanding lime has been laid on and the ground treated according to he usual custom of improving wastes ; yet, after a few crops taken, seems verging back towards its original state of poverty." Mr. Hinde has kindly favoured me with the following interesting particulars respecting the present state and cultivation of his farm, Newlands Hall, situated 6 miles south-east of Lancaster; it lies exposed to the west winds, and is about 300 feet above the sea :—

"Ellel Moor was enclosed by a special Act in 1756, laid out into farms, and brought under cultivation. Draining and trenching have both been carried on from time to time to a limited extent, but not on a regular or fixed system. The soil is from 2 to 5 inches deep, growing in its natural state—rushes, whins, or gorse, alder bushes and heather; it lies upon a yellow bastard clay, full of stones, and frequently containing large quantities of oxide of iron, making it very hard to cut for drains; the rock is the millstone grit; the land varies so much, that thero are hardly two acres exactly alike. I took possession of the farm, which consists of 77 statute acres, in November, 1843. It has an excellent house and good farm buildings. The tenant had been on it for twenty-two years at a rent of 44*l.* per annum; but for want of energy, and from bad management, he had brought himself to a stand still. I commenced draining, trenching, and sub-soiling. I did not cut any drains the first year on the thorough-draining principle, not feeling sufficiently informed of, or confident in, the system; since then I cut them 30 inches, and latterly 3 feet deep, at 7 yards apart, upon Mr. Smith, of Deanston's plan, and find them answer extremely well. I occasionally used 1¾-inch tiles, and at other times, from the quantity of stones there are, sough-drains, with broken stones on the top. I have been successful in most of my crops: in 1845 I gained the premium for the best crop of Swedish turnips at the Lancaster Agricultural Society's Show, competing with the best lands in the neighbourhood of Lancaster—Burton and Milnthorpe; the crop weighed 24 tons, topped and tailed, to the statute acre. In 1846 I had 8A. 3R. statute of turnips, cabbage, mangold, and potatoes; the field was thorough drained, but neither trenched nor subsoiled; it was formerly two fields, and I expended 75*l.* in draining, levelling fences, picking stones, &c.; and I may here mention that the value of the land, as made by two most experienced land-valuers at the time I bought it, was 6*s.* per acre for one field, and 8*s.* per acre for the other, at twenty-six years' purchase. The crop was not weighed; but I sold by auction 2A. 3R. 35P. statute of Swedes, which realised me 47*l.* nett towards the outlay of 75*l.*, leaving me above 5 acres for my own; last year I mowed a most excellent crop of rye-grass; so that I think it has nearly redeemed itself, and is in a very different condition to what it was. In the winter of 1847 and spring of 1848 I trenched and drained 6 acres of old ley, and trenched 4A. 1R. 35P. of oat-stubble for green crops, the account of which I give below. The plan I proceed upon is to set my trenching in beds of 7 yards wide, the fall of the land, a drain being cut on each side of the bed. I provide, in the first instance, stones for the first two or three drains, and then commence trenching to the depth of the soil only, breaking up the subsoil to the depth of 10 or 12 inches with a pick, and throw all the stones on the top of the trenched land. This year I have used strong forks about 7lbs. weight, with a projection in the back this form T, in order to give more leverage. I prefer them to the pick, being, I think, more effectual, and easier for the men. Whilst the trenching is going on, I have other men cutting the drains in the entrenched land, and the stones on the trenched land are wheeled in barrows to the drains, the land abounding so in them that they have seldom to wheel them more than 14 or 20 yards, so that I hardly ever have a horse and cart in the field. I believe this plan to be the cheapest and most effectual for my land, and I have given up the subsoil-plough; the trenching is done by the customary measure of 7 yards square to the rod, or fall, as we call it; the price 8*d.* to 9*d.*; at which price a good man can earn from 2*s.* to 2*s.* 3*d.* per day; the drains are cut by the rood of 7 yards long, 3 feet deep for stone soughs at 7*d.* and 30 inches deep for pipe-tiles at 5½*d.*; the soughs are made, tiles laid, and stones filled, and drains filled up by day-work.

"Expense of thorough draining, at 30 and 36 inches deep, and 7 yards apart, trenching, &c., 6 statute acres of old ley on Ellel Moor :—

	£	*s.*	*d.*
Grubbing whins	2	5	0
„ alder bushes	1	12	9
Trenching 595 falls of 7 yards square, at 8*d.*	19	13	8
Cutting 685 roods of drains at 6*d.*, tiles, stone-breaking 258 cubic yards, laying tiles, filling up drains, &c. ...	45	18	11
Labour, getting up large stones and alder-bushes, not let by contract, &c.	10	0	0
	£79	10	4

"I removed 920 one-horse cart-loads of stones from the land after it was drained and trenched, which I sold to the Surveyors of Roads, and which paid for the removal, the road being alongside the field, besides 70 loads of good rubble walling-stones from the large stones we had to break up with hammers and wedges. I sowed the field with Scotch lean oats, and gave it 2 cwt. of Peruvian guano to the acre; it produced 197 thraves, the band being made small on account of the wet season; the straw was strong and full, but I have not weighed it for thrave. In corn it gave 44½ bushels per statute acre, of 39 lbs. to the bushel; and having made meal several times, I find it gives me 4 loads of 240 lbs. to the load per statute acre. I am now ploughing it for a second crop of oats with a hand dressing, probably superphosphate of lime; and the condition of the land is most satisfactory.

"From the 4a. 1r. 35p. of oat-stubble which I trenched, I removed nearly 500 one-horse cart-loads of stones, and sold most of them to the roads. I sowed it with Swedes, mangold, carrots, and a few potatoes; and considering the wet summer, I had a very fair crop of swedes, about 18 tons to the acre; and with what I have sold and have to sell, I shall more than twice cover the expense of trenching. For mangold-wurzel on poor lands like mine, independent of the muck put into the stitches, I strongly recommend the practice of dibbling in with a trowel every 10 inches a prepared compost, and placing the seed immediately upon it. The compost I made last year consisted of bones, horse-feet parings from the blacksmiths' shops, hen manure, which I carefully save, and ashes, or still better, refuse charcoal: these were put into a heap under cover, and well wetted with tank-liquid, and left to heat for two months. I have a light wooden roller, the same as a garden roller, 30 inches in diameter, with three strips of wood projecting about an inch railed on at every 10 inches longitudinally; it covers two stitches at once, 30 inches between each, and is drawn by men, and consequently levels to the top of the stitch, and leaves a mark every 10 inches. The compost is put into buckets, and with a garden-trowel the labourer takes out a trowelful of earth and replaces it with a trowelful of manure. The cost of doing this per acre is from 10*s.* to 12*s.*, if done with men: could women or boys be had, it would be less. I steep my seed in liquid manure twenty-four hours, and put in a bag two or three times larger than required, in order to be able to turn the seed and lay it on the midden in a gentle temperature from four days to a week. The bag must be turned every day, and great care taken not to place it in too hot a berth. Last year my hind over-heated and destroyed the seed, and the consequence was I had at the third weeks' end to redibble fresh seed; notwithstanding which I had nearly as fine a crop as any I saw in the better land in the neighbourhood of Lancaster, owing to the compost and liquid manure. I dibble the seed in with the finger and thumb, placing three seeds at a little distance from each other in the compost at every 10 inches, and cover lightly with the finger. I have thus had it up in a week from the time of sowing. For carrots I recommend, after they are weeded and about 2 inches high, to give them, if the weather be damp, 1 cwt. of guano and 1 cwt. of gypsum per acre, sown on them early in the morning. I did so last year upon my crop, which I thought worthless, and the effect was astonishing.

"*Rotation.*—My general rotation is—of old tough ley, two crops of oats, both hand-dressed; two, turnips, mangold, drilled beans, potatoes, cabbages, and carrots; three, oats, with grass seeds, either mown or left to pasture three or four years—if mown, ploughed up earlier. I do not, however, follow strictly any rotation, but depend entirely upon the condition the land is in. I have two liquid-manure-tanks, and attribute my success in growing green crops mainly to its use upon the first appearance of the plant. My common turnips were sown very late last summer; and in applying the liquid manure when in seed-leaf several rows were missed. The result was that I had not one-third of a crop on that portion, the fly destroying them; and what remained, for the want of a stimulant and ready concocted food—liquid manure—made very poor progress, the season being late.

"*Manure.*—Since 1843-4, my first two years, I have bought no heavy manure, and very little guano—about a ton to 25 cwt. per ann. I find it the most advantageous to make the manure on the premises, by buying linseed and straw for bedding, and laying on as many cattle in the winter as I can accommodate for feeding. I have never bought a single ton of horse or cow manure—only night-soil from the factories, which nobody thought much about, when I first commenced.

"*Cattle.*—the greatest number of cattle kept by the last tenant were in summer never more than five milch cows, and about four or six head of young stock, a pig, and two horses. In 1846 I milked 15 cows, besides having young stock; three horses, and three brood sows and store-pigs. Last summer I milked twelve cows, having rather more under the plough; and this winter I have nine milch cows, two two-years-olds, and five fat beasts in my shippon, five yearling calves, one back-end calf, two nine-months-old bulls, three horses, two brood-sows, and eight store-pigs. I have grown Italian rye-grass, and mown three crops; and now that the land is in better condition for it, I shall sow it again. I grow a very heavy crop of tick beans in 1847, broadcast, and well mucked with farm-yard manure. The extent of land was a customary acre, or 1A. 2R. 20P. statute, and I had sixteen loads of 280 lbs. to the load and 147 lbs.

(Signed) "RICH. HINDE."

NORTHERN DIVISION.

(No. 3.)

To the north of the river Lune the county becomes rapidly contracted in its limits, being confined on the one hand by Westmorland, on the other by the sea; over the sands to the north-west there is the rich district of Furness and a hilly tract of some extent, which naturally seems to belong rather to Cumberland and Westmorland than to this county. Throughout the whole of this northern division the transition limestone, slate, and grey-wacke strata prevail; and the difference in the improved appearance of the surface is very perceptible, whilst the cultivation is decidedly superior to many other parts of the county. Furness seems to be the *redeeming feature in Lancashire farming.* In the soil, the class of farmers, and their general management, this district would not suffer by comparison with other more favourable and accessible parts of England. It is difficult to conceive two districts more distinct in every respect that can interest a farmer than that on the eastern side of the southern, and this on the western part of the northern division of the same county. The one cold and wet, growing a bad herbage and rushes, and divided into small holdings, with a manufacturing population, who, *occupying* the land, cannot be said to *farm* it; the other for the most part naturally drained by a substratum of gravel and limestone, in the occupation of men who pay, in some instances, as much as £600 a year rent, producing beautiful crops of wheat, oats or barley, turnips, and seeds. Soil of every variety, from a strong clay to a light sand, may be found within the limits of this division; but it is generally light and friable. In the neighbourhood of Cartmel and Holker there is a good deal of hard land—stony, but very productive. Over-sands, around Ulverstone and through the whole district of Furness, it becomes stronger, of a red loamy nature, and produces good crops of grain; on the sea-coast it is lighter and more sandy. There are two distinct classes of farms in this district—those which belong to large landed proprietors, such as the Earl of Burlington, the crown, and others; and those which belong to small freeholders. The former are large, and superior in number and class to other parts of the county; they range from a rental of £150 to £400, and some few higher than that, even to £600 per annum. The latter are freeholds of not more than 40 statute acres, the property of a class of men known in that country as "statesmen," who, living on their own farms from generation to generation, are content with their small inheritance; and not having wealth nor the means of procuring it, live a primitive and independent life amongst their native hills. These men were formerly the worst farmers in the district, but they are now becoming more alive to their own interest, and willing to profit by the good example of their neighbours. What Mr. Dickson wrote of this district in 1814 is still true with respect to the occupation and size of the farms. To the north of the Lancaster sands they range from 20 to 100 statute acres; but farther north, in the vicinity of Ulverstone and in Low Furness, they are as high as 300 or more; and the Furness Abbey farm, Gleaston Castle, and Holbeck, the property of the Earl of Burlington, still hold the first rank. The rental of land in this district ranges from 15s. to 32s. per statute acre. There is not much wheat grown now in the northern district, except on Walney Island, off the west coast of Furness: the prevailing grain crops are oats and barley, the latter being taken by the maltsters at Dalton and Ulverstone. The rotation formerly was, out of ley—1st, oats; 2nd, barley, manured; 3rd, clover; 4th oats; and grass seeds, or turnips after oats; but the course is now improved to—1st, oats; then, where the sward is old and tough, a second year of oats; 2nd, turnips, manured, or potatoes; 3rd, barley; 4th, seeds for two or three years. This land might be made equal to a four-course shift, but it will not do yet; and when wheat is grown, it is not advisable to dispense with a fallow. In Walney Island wheat is grown generally, and the system is—summer fallow, wheat drilled, beans, barley or oats. Mr. John Patterson, of Holbeck farm, to whom I am indebted for much of my information respecting this district, came from Northumberland about nineteen years ago, and, after his long experience of the country, finds no reason to complain either of the soil or the climate; the latter, though more rainy, he finds not so cold as on the eastern side of England. His farm is about 340 statute acres, and for the most part naturally drained, with a rich loamy soil capable of growing anything. His system of cropping is as follows:—1st, oats, say 60 acres; 2nd, fallow 30 acres, turnips or mangold-wurzel 30 acres; 3rd, wheat after fallow and seeds, barley and seeds after turnips; 4th, seeds for two or three years, and so on *vice versâ*, taking care that all the land lies fallow in turn, as he considers it quite indispensable, on account of the scarcity of hand labourers in the district. He grows from four to five quarters of wheat to the acre, and considers 25 to 30 tons of turnips a good crop. Rape has been grown in the district and eaten off, but it is found that the crop of turnips next succeeding it in the course is not so good, and consequently it is becoming unpopular. His farm buildings are commodious, with yards and sheds for his young stock attached, and the whole district is well provided in this respect; Lord George Cavendish, of whom Mr. Dickson makes frequent mention, having taken great pain to improve them about 30 or 40 years ago. The farms on this property are mostly held on yearly tenancies; leases are not asked for, and therefore they are not granted; but his lordship, under the advice of an able and active agent, Mr. Drewry, has lately introduced a new form of agreement, by which the tenant is bound "not to take two white-straw crops in succession (except the field has been ten years or upwards in grass, when a second straw crop may be taken), nor in any year to have less arable land in fallow, turnips, or other green crops, properly cleansed and manured, than is equal to half the land sown with white-straw crops, and shall not grow white straw, corn or grain, on more than 2-5ths of the arable land." He has also added compensation clauses for unexhaused improvements, as is customary in Lincolnshire; and this is allowed (on the fulfilment of certain conditions) to the out-going tenant, whether he give or receive the notice to quit. The proportion of the proposed conditional allowances to be regulated as follows :—

"*For bones* used on the land, the allowance to extend to three years; half the cost price to be allowed after one crop, one-third after two crops, and one-fourth after three crops. *For guano* used on the land, the allowance to extend to two years; one-third of the cost price to be allowed after one crop, and one-sixth after two crops. *For rape-dust* used on the land, the allowance to extend to one year; one-third of the cost price to be allowed after one crop. *For linseed cake* used for feeding cattle and sheep, one-third of the cost price to be allowed for that which has been used since the 1st of October then last, and one-sixth of that used during the preceding twelve months. N.B.—Cake given to horses, no allowance for."

Draining, when necessary in this district, has been done chiefly with horseshoe-tiles and for soles the refuse slates from the quarries of the country. There are four tileries in furness, two belonging to the Earl of Burlington, and two to other parties. In the former they have made pipe-tiles, during the last year, of 1½-inch bore, still using the horseshoe for the main drains. The drains are cut 3½ to 4 feet deep, at intervals varying from 10 to 14 yards; and the whole expense of making the drains, carting the tiles, &c., is paid by the landlord, and the tenant charged 5 per cent. on the outlay.

In the year 1838 the *North Lonsdale Agricultural Society* was established; the shows are usually held at Ulverstone, some time in October; and to this society may be attributed in some measure the great improvement in stock and farming, but especially the former. But to Mr. William Cranke, of Hawkfield, is due the merit of *first* introducing the short-horns into his native country of Furness. As far back as 1813 this gentleman brought some of this stock from the banks of the Tees. They were not favourably received, and for a long time after their arrival the old long-horns kept their ground; but in 1838 this gentleman received from his friends and neighbours a substantial proof of the high opinion in which they held his services as an agriculturist, in the shape of a silver salver of 25 guineas; and, as a whole, the stock Over-sands is equal, if not superior, to that of any other district in the country.

I have thus endeavoured to describe the soils and important points in the general or particular management of land throughout this county, with the chief improvements and alterations at present going on ; and I propose now to consider separately under their respective heads the character of their buildings, stock, implements, &c. ; with the improvements still required in the reclamation of waste lands, and conclude with a few remarks on the present prospects of agriculture in Lancashire, and the condition of the farm-labourers.

Buildings.—The materials of the buildings in this county are brick and stone, and vary according to the different situations and circumstances of the districts. These are, however, easily defined : throughout the whole of the eastern or northern parts, the rough stone buildings prevail, with flags or slates for the roofing. On the low country to the south and west, where stone is scarce and clay abundant, bricks are in use, with thatch ; but in the better class slate is found, imported either from North Wales or brought from the north of the county. In the low alluvial districts the old houses and cottages were made by a framework of wood, filled up with wattled stud-work, and covered over with a composition of clay and wet straw, locally termed *clat and clay ;* these houses are thatched with straw, and, being whitewashed inside and out, have a tolerably clean and picturesque appearance when new ; but they are frail tenements at the best, and apt to get out of order, and are rapidly disappearing in favour of more substantial habitations. The farmsteads are for the most part badly arranged, with little attention paid to ventilation or the economy of space and labour, now considered so necessary in a well-regulated farming establishment. The hay and grain crops are generally housed in large barns, which form a prominent feature in the yard, whilst the humble but more important requisites of steaming apparatus, with chaff and turnip cutting machines, are seldom met with ; large boilers are sometimes used by the more intelligent farmers, who are now beginning to discover their true interests in this respect.

Stock Cattle.—The Lancashire long-horned cattle were once famous all over the kingdom ; they were remarkable for the great length of horns and width between the tips, sometimes as much as four feet, and even more ; the hide, thick and firm in its texture, was well adapted to resist the climate ; and, though they did not give very much milk, it was considered to afford more cream in proportion to its quantity than that of other kinds. Mr. Bakewell, of Dishley, is said to have made them the basis of his improvements in stock. As oxen they are quite unprofitable, and not being good feeders they have gradually given way to the short-horns, which are finer in the bone and hide, and in fatting quality superior to any other breed. At Woodacre Hall, near Garstang, Mr. Daniel, a tenant of the Duke of Hamilton, on a farm of nearly 500 statute acres, has still some of the old and now despised long-horned breed, and prefers them for their hardy constitution, and the quality of their milk. He maintains that seven quarts from one of his cows will give as much butter as ten quarts from a short-horn. They are longer in coming to maturity, but they also last much longer, and will produce calves up to fourteen or sixteen years of age. I saw the horns of one, measured by him, which were six feet one inch from tip to tip : the tape being taken down the horns and across the head. Many gentlemen have endeavoured to raise the standard of stock in the county : in the northern districts Mr. Cranke, of Hawkfield, Messrs. Patterson, Holbeck, Mr. Ashburner, Mr. Ormandy, and a few others in Furness, and Mr. Robinson, near Ulverston, the Earl of Burlington, Mr. Rawsthorne, of Heysham, near Lancaster, Mr. Wm. Garnett, of Quernmore Park, the late Mr. Ford, of Ellel, Mr. Birchall, near Preston ; and in the south Mr. Bannerman, near Chorley, Mr. Eastwood, near Burnley, and Mr. Harvey, near Walton, Liverpool, have each contributed to introduce high-bred animals ; but the finest short-horn stock in the county is perhaps Mr. Towneley's, of Towneley, near Burnley. By recent purchases this gentleman has collected together a most valuable herd, which must help to improve the stock, not only in the Southern Division, but throughout the county generally.

Sheep.—There is no breed of sheep peculiar to this county ; nor, except in the hilly districts, are they an important item in the farming stock. Large flocks of the black-faced breed ramble over the eastern moors of the Middle Division, very inferior to what they might be with a little care and attention in the breeding. Early in the spring they are put on the hill pastures, where they remain till November ; they are then brought down into the enclosed lands, and salved with a mixture of butter and tar, to prevent their having the scab and losing their wool in the early spring ; the young animals, or hogs, in the first winter, suffer from the blackwater, a disease brought on by exposure to wet and cold. The best remedy for this would be the erection of sheds, however simple and rude in construction, in which the sheep might be protected from storms both by day and night, a luxury at present unknown to these poor animals. In the hills of the Northern Divison there is a considerable improvement ; and on the fine lands of Furness a large white-faced sheep, a good deal like the Leicester, prevails. Lord Burlington has lately introduced at Holker the South Downs, which answer exceedingly well, and the successful result of the experiment seems likely to lead to their general introduction into these parts. Mr. Robert Garnett, of Wyreside, has taken some pains to introduce a better class of black-faced sheep, and about four years ago sent down to the Highlands for a flock of the improved Scotch breed. He has met with little encouragement amongst the farmers of his district : some few, however, begin to appreciato them, and their value is now much beyond that of the common sheep of the county. Mr. Smithies, of Bickerstaffe Hall, in the Southern Division, has also for the last two years tried some Shropshire Downs on his farm; they are a hardy and productive breed.

Horses.—Many horses are bred in Lancashire, and the farmers naturally have a taste for the practice; but, except in the western parts of the Southern Division already mentioned, they are not of a first-rate class, nor are they as good as they were a few years ago. There is a fair supply of good carriage-horses and hackneys for general work; at Oversands, in the neighbourhood of Ulverstone and Furness, more high-bred horses are found than elsewhere. Mr. Kennedy, of Ulverstone, has, by his enterprising exertions, contributed greatly to raise the standard there; for this purpose he has brought down thorough-bred stallions from Col. Peel's and other racing studs for the season, and horses are sold out of this country at four years old for £80, £90, or £100, a-piece. The depreciation of value alluded to above, especially in the agricultural horse, is owing to the little care and attention paid by the breeders to the mares, and the miserable parsimony which pervades their practise in this respect—"ex nihilo nihil fit;" and they seem to forget that it is impossible to breed a good and valuable foal out of a miserable and broken-down mare.

Pigs—Are generally good throughout the county; in this respect we are above the average of other better-farmed parts of England; the cottager always finds it an advantage to keep a pig, and it is very seldom that a bad one is seen. At Lathom there is a good breed of the small kind; Mr. Smithies has got some of the Berkshire breed, and crossed them with Mr. Hobbs's, which has produced a good stock and easily fattened. Mr. Billington, of Preston, has also some of Mr. Hobbs's breed. Mr. Swift, of Samlesbury, carried away two of the prizes given by the Royal North Lancashire Agricultural Society last September at Preston, for a boar and a sow.

Manures.—The most important manures used are lime, marl, sea-sand, bones, guano, ashes, town-dung, farm-yard dung, and compost of various kinds. *Lime* is used throughout the county almost universally, and is now mixed with salt, for moss cultivation; *marl* chiefly on peat and moss lands; *sea-sand* on the same kind of land near Cartmel. *Bones* are becoming very general, and are found most beneficial, both as a top-dressing to grass-lands, especially on the high grounds, and as a manure for turnips; but *guano* takes the precedence in this respect. From one end of the county to the other, from Holbeck to Halewood, this foreign manure seems to be valued most highly, especially mixed with farm-yard manure for turnips. On the Barton property, Mr. Logan, agent for Mr. Jacson, informed me that it had been applied largely and successfully: 2½ cwt. to the acre on meadow land in the first year, and half the quantity the second, has produced in both years double the quantity of hay that could otherwise be grown. For turnips 3 cwt. or 3½ cwt. per acre is necessary, but a less quantity, mixed with farm-yard manure, is found to answer better than anything. The guano first stimulates, and the manure sustains or feeds the plant. Messrs. Myers and Co. have kindly given me the following return of imports of Peruvian guano into Liverpool, viz. :—

1841	1140 Tons.
1842 1843	3307 „
1844	13,927 „
1845	11,151 „
1846	16,221 „
1847	21,482 „
1848	13,852 „
Total	81,080 Tons

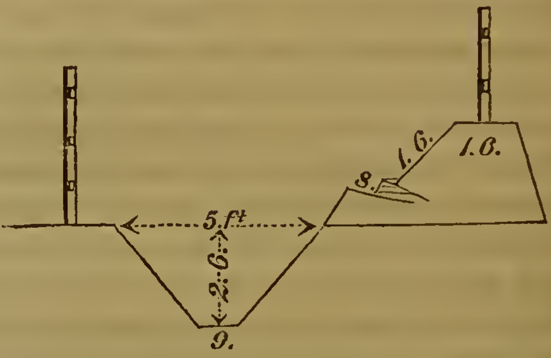
Besides this, great quantities from Africa have been imported by different people, and of course it is impossible to say how much has been sold for farming purposes in Lancashire, but there is no doubt that a very large quantity has been, and continues to be, used. *Town-manure* is by no means collected and made available as it might be ; the difficulty of transporting it is the great obstacle to the use of it. If we were as careful in this matter as the Chinese, we should have in the large and numerous towns of this county mines of wealth from which the produce of the soil might be increased to more than double what it is. From Liverpool it is taken down by the Leeds and Liverpool Canal as far as Rufford, and from Manchester by the Bridgewater Canal to various parts of Cheshire, and to Stretford, Worsley, and Chat-moss in Lancashire, to the amount of 20,000 tons in a year, and the practice is greatly on the increase. The cost from Manchester, exclusive of cartage to and from the canal, is about two-thirds of a penny, or for short distances 1½d per ton per mile. It has recently been tried in a liquid state and applied to the land adjoining the canal by means of a hose—this experiment gives so far every reasonable prospect of a successful issue. Considerable quantities are taken to Chat-moss by the river Irwell, which flows to the south side of the moss, and the cost of transport is rather lighter than on the canal.

Irrigation.—This mode of improving grass lands has been little tried in this county, and when attempted, not on any extended or scientific plan. Mr. Dickson, in quoting from the "original Report" on this subject, says, "It is a matter of astonishment that so rich a source of improvement has been hitherto so much neglected ;" and the same remark is still applicable.

In a country like this, where rivers and rivulets abound, there would be comparatively little difficulty or expense in throwing the fertilising streams on the land. Mr. Logan pointed out to me some meadow land in Barton which had been irrigated with very satisfactory results, when the land was under-drained previously ; it had produced a double crop : and without under-draining, irrigation ought never to be thought of. In this instance, however, it is right to state that the irrigation was laid down scientifically, and at a *very considerable outlay*, by the late Mr. Geo. Jacson.

Fences.—In the hilly districts a dry stone wall, without mortar, is the common fence, built about six feet high, to prevent the encroachments of the wild mountain sheep; yet such is their activity and rambling habits, that this is scarcely sufficient to stop them. In the low country the fences are professedly made of quick thorns, but almost invariably they are so badly managed, and so miserable, that they require thorough renovation. Mr. Lamb has within the last few years taken some pains to introduce good fences on the lower part of the Duke of Hamilton's estates, and these answer exceedingly well, a sufficient proof that it is not the fault of the soil or climate that they are generally so wretched. About three miles of new thorn fences have been made during each of the last two years. The method and form are after the Scotch plan, and as follows :—

	Ft.	In.
Width of ditch at top	5	0
Ditto at bottom	0	9
Depth of ditto	2	6
Scaresment width	0	8
Soil for thorn bed	0	4
Height from scaresment to top of back	1	6
Inclination of slope one inch in one.		
Width of top of backing	1	6



With posts and railing of two bars on the top of the backing, and post, with three bars on the field side of the ditch, the cost of the frame is as follows :—

	s.	d.
Three heights of rails and posts, and putting up, per rood of 7 yards	2	6½
Two ditto ditto	1	6½
Thorns and beeches, say 54 per rood	0	7
Planting and making ditch according to subsoil, varying from 1s. to 1s. 4d., say average	1	2
Total per rood of 7 yards	5	10

The yearly cost of cleaning thorns is from a halfpenny to three farthings per rood for the first five years. Cutting with a Scotch knife attached to a handle three feet long, costs from a farthing to three farthings per rood, if done by a man accustomed to the work; and this plan has produced good fences at five years' growth. When the posts and rails are removed, by laying a drain in the bottom of the ditch, the plough may go close to the fence. The greater part of the old hedges are very irregular, and occupy a space of four or five yards, with a ditch on both sides of the fence; and where land is divided into small fields, as in Lancashire, the acres that are lost by this old system must be very considerable.

Implements.—The use of good agricultural implements has been rapidly increasing during the last few years; Finlayson's cultivator, and a turnip drill for sowing two drills at once, introduced from Berwickshire, are in common use in the neighbourhood of Lancaster; and within the last few years there have been between thirty and forty thrashing machines worked by horses set up in the same district. These are also brought from Scotland, and cost about £40. The Norwegian harrow, Croskill's clod-crusher, Ducie's drag, with various grubbers and cultivators, and drills for seed, I have met with on the farms of gentlemen and large farmers, such as Mr. Patterson, of Holbeck, and Mr. Smithies, of Bickerstaffe, but many of these are too costly for general use.* The one-horse carts which prevail throughout the county are very good, and the iron ploughs are generally superseding the wooden ones. On the cheese farms the old stone weights are making way for the iron lever presses, and there is throughout the county a general improvement in this respect. The small moveable tram-road used by Mr. R. Neilson, Mr. Wilson Ffrance, and the Rev. W. Hornby, of St. Michael's, is, on level land, a very valuable acquisition to the farm-yard, and in our wet climate the greatest convenience in getting turnips off the land. The railway, which consists of a light bar of iron placed longitudinally on wood, in pieces of sixteen feet in length, costs, complete, about 11s. 6d. per piece, and the waggons about £3 10s., but this of course, depends upon the price of iron and timber. It is some credit to the mechanical genius, now first applied to agriculture in this county, that at York the prize tile machine for making draining pipes was the production of a Lancashire workshop.†

In the art of *Reclaiming and Cultivating Waste Lands,* no doubt "much has been done, but more remains to do." Besides the mosses and high lands of the county, which, as we have seen, are gradually changing their barren nature into fruitful soils, there exist also large tracts of land by the sea-coast, which at present form part of the shore, that might, by embankments, be recovered from the sea.

In the year 1820 Mr. Edward Dawson of Aldcliffe Hall, near Lancaster, received from the Society of Arts their large gold medal for embanking 166 acres of marsh land near the mouth of the river Lune; the particulars of the method adopted are given in the Society's Transactions, vol. xxxix., No. vii. p. 33. This reclaimed land has produced luxuriant crops, and there is no doubt that land of this description would amply repay the required outlay: after allowing 5 per cent. on the money expended in enclosing Aldcliffe Marsh, each acre pays 25s., the former rental being

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* The former gentleman has used for the first time this season Garrett's Corn Drill, which he considers a very excellent implement. In a short note addressed to me on the subject, he says, "We only use two-thirds of the seed which is used in broadcast, and our crops look *remarkably promising.*"—*June* 2.

† See Report of Implements at the York Meeting, 1848. Journal of the Royal Agricultural Society.

2s. 6d. If Cockerham, Pilling, and Thurnham sands were enclosed, on he lowest calculation 5000 acres, at present worth little or nothing per acre, would by an outlay of 14s. or 15s. per acre be made worth a yearly rental of £5,500.

In the year 1838 an extensive project was formed for the enclosure of 46,000 acres in Morecambe Bay; the intention was to cross the bay by a railway, but the Commissioners of Railways, being directed to compare the line with one by Kendal to Carlisle, reported in favour of the latter, on account of its being more direct, giving no opinion upon the work of enclosing the Bay, which, however, by engineers, is considered perfectly feasible.

Of late years science has been directed to the great scheme of international communication by railways, which have absorbed the surplus funds of the country; but as these extensive works approach their completion, it is to be hoped that public attention will be turned to such undertakings as the enclosure of the Bay of Morecambe, and for which the coast of Lancashire seems distinguished by peculiar advantages, as it is estimated that more than 80,000 acres might be reclaimed to the north of the river Wyre.

In other parts of the county no great alteration can be effected in the produce without a thorough system of drainage, and that the landowners and farmers are now really becoming aware of the importance of this first step is clearly proved by the many tileries which have sprung up during the last few years. There are now in

The Southern Division

Tile-kilns belonging to Sir T. G. Hesketh, Bart., Mawdesley.
Mr. Holland..................Leyland.
Mr. Fazackerley............Lathom.
Mr. Hargreaves ....Broadoak, near Accrington.
The Earl of Ellesmere....Worsley.
Mr. Hoghton..................Bold.
Mr. Whalley ....Chorley.
Mr. Chaffer ....Burnley.
The Earl of Derby.......... Bickerstaff.
Do.............................Near Knowsley.
Mr. Doulton and Co.........St. Helen's.
(Name unknown)............Oswaldtwistle.
Col. Rawstorne...............Penwortham.
Mr. Hatton.....................Moss Hawk Hall.
&c. &c.

In the Middle Division.

Tile-kilns belonging to Mr. Clifton (2)............Lytham.
Mr. C. R. Jacson.........Barton.

Mr. W. Garnett...........Bleasdale.
Mr. Hull.....................Whittingham.
Mr. Wilson Ffrance.......Rawcliffe.
The Duke of Hamilton, Cabus.
Mr. Threlfall ....Hollowforth.
Mr. Edmondson ....Caton.

In the Northern Division.
The Earl of Burlington (2) Furness.
Other parties (2)...............Furness.

But draining requires great care in the work, and a perfect knowledge of the circumstances of soil, subsoil, springs, &c., and the points suggested by Mr. Bullcock Webster on this subject cannot be too well known. The following are a few of the most important, taken from a short letter addressed to the editor of the "Ayrshire Agriculturist :"—

"1. No general rule can be laid down.
"2. Any one system for all soils is an absurdity.
"3. Depth and distance of drains must depend on the nature of the soil and subsoil.
"9. That grass land can be over-drained.
"10. The direction the drains should be laid must be governed by the strata to be cut through, the fall, and other local circumstances; the rule of going always with the fall is decidedly wrong.
"11. There are instances (in the new red sandstone) where drains will act perfectly at 40 yards apart ; and there are strong clay subsoils that require drains every 6 or 8 yards.
"15. On the strong clay subsoils (not surcharged with under-water) drains 30 to 36 inches deep, at moderate intervals, are much more effective than deep drains at wide intervals, and on these soils the clay should not be filled in over the tiles or pipes.
"17. It often happens that drains 4 feet deep and 40 feet apart are placed over a field, when one drain properly put in would cure the whole."

Nothing has been so fatal to the progress of agricultural improvement as the dogmatical assertion of the absolute necessity of conforming to or adopting *one* practice, as the only good one, in all cases and under all circumstances. The real thing to be studied is, how best to make those circumstances available which are within reach, and not to abandon the hope of success, or the effort to obtain it, because the same facilities which have enabled our neighbours to be successful are not within the compass of our grasp.

As auxiliaries towards the advance of agriculture and the full development of the resources of the county, the railways must not be forgotten ; they are extending gradually, like a net-work, over the face of the county, especially in the southern division, affording facilities before unknown in the transport of produce and manure, and are effecting a revolution in this respect, which is very important to the farmers. In many parts of Cheshire, where formerly cheese was made, the milk is now taken at once by the railways to Manchester and Liverpool, and the effect of this is, that the cheese-merchants come down into the north to look for that supply which formerly they obtained from the neighbouring county. This has given a new stimulus to the dairy-farmers; and I have been informed by a leading cheesefactor at Lancaster that, during the last few years, the cheeses in the northern districts have in fact improved wonderfully, and that now much more care is paid both to the making and the keeping of them. All this tends to confirm the opinion which prevails amongst many of the most influential practical farmers of the county, that the dairy and the cheese-room must be the chief objects which all our agricultural improvements ought to have in view.

The Agricultural Societies also deserve a special notice. Within the last few years the spirit of inquiry and desire to obtain really useful and practical information on farming matters has extended throughout this county, in common with the rest of the kingdom: we are, in fact, in a transition state, in which every advance in the right direction not only leads to positive improvement, but affords encouragement to further exertions—"vires acquirit eundo." The different agricultural societies which have been established in various parts of the county within the last twelve or thirteen years, are a proof of the vitality of this spirit of improvement. They were, in fact, the waking efforts of a people shaking off their lethargy; and though they may not perhaps have entirely answered the expectations of the founders, they have not been unproductive of good. A few years ago every town, especially in the northern districts, had its agricultural society. Ulverstone, Lancaster, Preston, and Blackburn vied with each other in their autumnal exhibitions, whilst the private societies of the Duke of Hamilton, Mr. Clifton, and Mr. Ffarington occupied the rural districts. Some of these have now disappeared, and others are amalgamated with their more powerful though younger rival, the Royal North Lancashire Agricultural Society. The same change has been taking place in the southern division; and Liverpool and Manchester, instead of having each their separate society, are now united in one. The principle of these large societies is, that they should be perambulatory, like the Royal Agricultural Society of England. It is hoped that by visiting in succession the different districts and important places within their several limits, they will bring within the reach of every farmer, at stated intervals of time, a show of stock and implements such as no local society could possibly present to him; and also, which is very important, afford him the opportunity of meeting with gentlemen famed throughout England for their science and practice, and hearing from them, in the shape of friendly discussions or lectures, their opinions and the results of their experience.

In education we are still very deficient, and also in capital amongst the tenant-farmers: both the means and the knowledge how to apply those means to the best advantage in the cultivation of the land are wanting in

Lancashire. This fact has such an intimate relation with the whole subject of leases and agreements between landlords and tenants, that it is impossible to enter fully into all the bearings of this most important question without taking it into account.

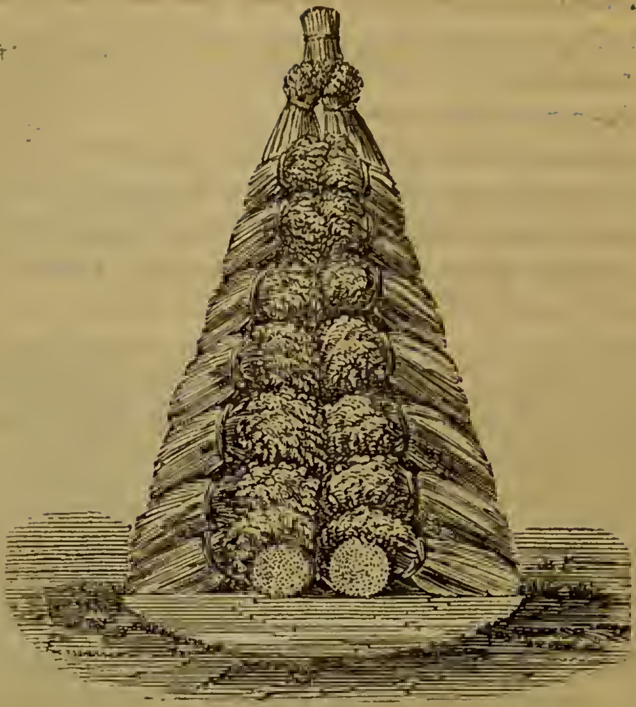
Lord Stanley, when presiding at Lancaster, in October, 1847, over the first meeting of the Royal North Lancashire Society, placed the matter in its true light as regards this county, and I hope I may be excused if I refer to his Lordship's speech on that occasion. His Lordship is reported to have said—

> "With respect to the arrangements between landlords and tenants, if they were not based on the strong ties and feelings of mutual confidence, he should then not hesitate to recommend that the holding should be secured by a lease, rather than by tenancy at will; because, although tenancies may be conducted in a manner that shall be satisfactory to both parties, leases give advantages which cannot otherwise be bargained or stipulated for. The conditions and durations of leases must necessarily vary under different circumstances, according to the condition in which the farm may be at the time of taking it; but if, as he had before said, the agreements between landlords and tenants may be considered based on the strong ties and feelings of mutual confidence, he thought there was little advantage in leases over tenancies. If the outlay for improving the farm has to be made by the tenant, then he should by all means be unrestricted, and allowed to receive the full and complete benefit for all his outlay; and at the end of the term, if a tenant had so honourably performed his part, the landlord would be unworthy the name of a man if he did not give such tenant preference over strangers, and on terms more liberal than would be proposed to any other applicant. If it should happen that a great outlay was required, the capital should be advanced by the landlord, and the tenant charged a reasonable interest upon it."

The establishment of Agricultural Schools and Farmers' Clubs would tend more directly than anything else to raise the standard of education; and, when anything of the kind has been attempted, it is gratifying to find that the advantages are soon appreciated.

The Earl of Burlington has founded a Farmers' Club at Dalton, which works well; and Mr. Wilson Ffrance, at Rawcliffe, has also tried the same thing on a small scale, which promises to lead to greater things. In both these instances that I have met with, a small circulating library, composed of elementary works on agriculture and agricultural chemistry, and others likely to interest a farmer, has been formed, and the books are lent out on certain simple conditions; they are read with great willingness, not to say avidity, and the success of these first steps affords encouragement to further progress in this most desirable direction.

The farm-labourers of this county are as well off, and perhaps better, than in any other part of the kingdom, except where manufactures are found, as in Yorkshire, &c., and their cottages for the most part comfortable and substantial. Fuel is cheap everywhere, whether it be coals or turf, and an able-bodied man can earn 12s. or 13s. per week in any district. Mr. Patterson, of Holbeck, gives his men 7s. a-week and their meat in the house, and Mr. Wilson, of Newton Park, has some in the house altogether; but this is not a good system, nor does it generally prevail. As a class, I should say they were better housed, better fed, better warmed, and better paid than in many parts of England where agricultural occupations are their only employment.



The section of a " Corn Mow."

February 28, 1849.

TO MR. GARNETT.

My Dear Sir,—I regret that I was from home when you called here on the subject of your Report of the Farming of Lancashire; but I now send you the particulars of the process of working the field you saw in turnips last week—a process which several years' experience induces me to recommend as the best and quickest mode of bringing heavy, worn-out land into good play.

The field consisted of many small fields, which I laid together, as my landlord desired. Having all been for several years over-cropped, under manured, and short weeded—or, rather, never weeded—I had all to do. I commenced by carting upon the stubble, in autumn, forty tons by weight of good farm-yard manure to the statute acre, and ploughing it in broadcast about six inches deep. I then cross-ploughed it with a four-horse plough, twelve inches deep, and subsoiled six inches below that. A portion was sown with winter-vetches; the remainder was exposed to the action of the winter frost. Early in spring two other portions were sown with spring vetches, at different periods. The portion unsown was then well worked, weeded of twitch, &c., ridged up, bow-harrowed, sown with one cwt. of a compost of sulphurized bones, guano, and charcoal, or wood ashes, ridged up again, so that the compost would form the seed-bed, rolled, and sown with turnips, which you saw growing well. As the vetches are cut off, the land will be transplanted with Swede turnips, which may be safely done as late as the middle of July. For work of this kind good implements are essentially necessary, and I have derived the greatest benefit from Croskill's clod-crusher and Stretton's Norway harrow, both equally valuable, the one on dry, and the other on damp land. I have also derived much advantage from watering the seed-bed, or the young plants, with weak manure-water, so as to stimulate it through the attacks of the fly; and I have given to Mr. Crosskill the model of a very simple and cheap contrivance, by which two boys can water four drills at a time, by means of a spout and four Indian rubber tubes attached to a common water-cart. If the water is near the field, they may apply it, with one horse and cart, to about six acres per day. During the period of the fly I also used, with much success, a straw brush, which passes over four drills at once,—a light pole, about eleven feet long, with a small wheel at each end. The pole is lapped with straw, which trails along the tops of the furrows, and disturbs the fly. It does not destroy the fly; but the chances are hundreds to one that the same leaf is not again attacked during that day; and a boy and light horse or pony can go twice over 10 acres a day with ease.

Many experiments and close observation of the result have convinced me of the value of this simple contrivance.

As my system of transplanting is different from any other, and has been very successful, I will give you the particulars.

I prepare a bed, and sow it early in rows about 8 inches apart, and thin out to 4 or 5 inches in the row. An acre will thus transplant about 20 or 25 acres.

As the vetches are mowed off, the space cleared is ploughed, well worked, dressed with 2 cwt. of the compost, and ridged up. As this work proceeds the plants are being prepared, and are planted while each drill is damp and fresh. As despatch is only produced by division of labour, the process is as follows :—One party, No. 1, pulls the best plants, keeping them "heads and tails," and carries them to another party, No. 2, who sits at the end of the ground to be planted, and who nips off the slender part of the tap-root and the upper part of the leaves, laying them in a basket, also "heads and tails;" No. 3 carries them up the field to No. 4, who lays them in the drill, with the leaves towards the planter's left hand ; No. 5, who must be a man or boy, that, striding across the drills, no petticoats may interfere with the plants just put in. I never use the dibbling-stick, which, in heavy land, only hardens the inside of the hole, but the planter is furnished with a light, hollow, half-round steel trowel, with which, in his right hand, he lifts up a portion of soil, while with his left he puts the plant in a slanting direction below it; then drawing back the trowel, the soil falls loosely on the plant, and a short stride of one leg takes him to the next.

The proportion of labour for pulling and topping depends on the size and position of the plants; but one layer will do for two ordinary quick planters, though my bailiff, whom you saw can transplant a statute acre in the day. I usually transplant from 15 to 30 acres per annum, and have raised according to the examination of the Inspector of the Liverpool Agricultural Society, 26 tons 4 cwt. per acre; but the land must be "mucked heavily, ploughed deep, and weeded clean," which I consider now, more than ever, the farmer's motto.

You allude in your Report to my invention of a portable railway, which, I assure you, is a most valuable implement. I sent a model the other day to his Grace the Duke of Richmond, for the Entailed Estate Improvement Committee of the House of Lords, and the railway may be got at a very reasonable cost from Mr. Crosskill of Beverly. By it I remove the whole of my green crops without the least injury to the land; and last autumn I put 127 tons of manure on 3 acres of land, lying from 220 to 400 yards from the manure-heap, at a cost in labour of 23*s*.

I can only repeat my regret that I did not see you on your visit to my farm, when I would have shown you the *modus operandi* of these different implements, and which I shall be happy to do on any future occasion.

Yours, &c.,

Halewood, June 2, 1849. ROBERT NEILSON.

DOBSON AND SON, PRINTERS, CHRONICLE OFFICE, PRESTON.